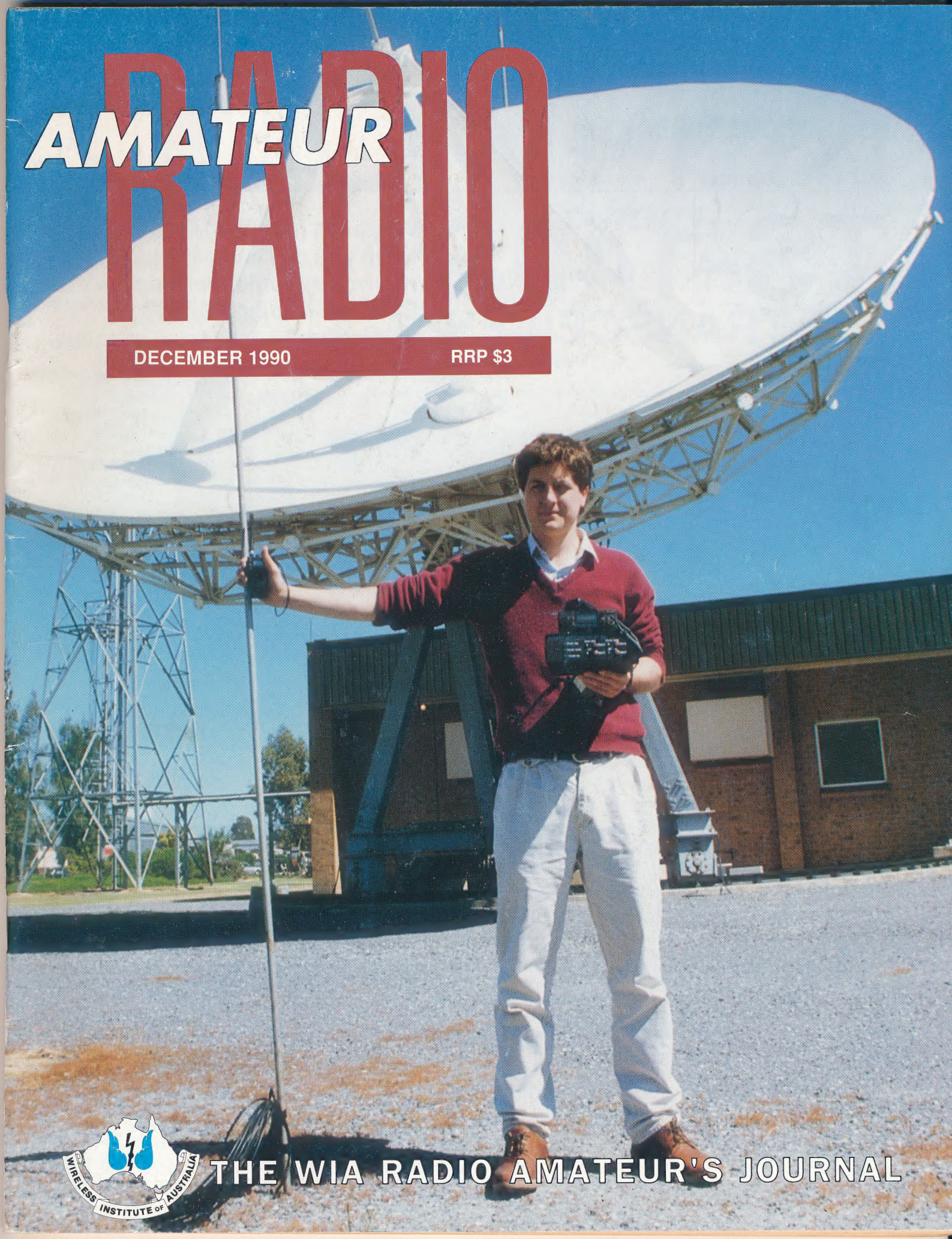
# AMATEUR RADIO

DECEMBER 1990 RRP $3



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THE WIA RADIO AMATEUR'S JOURNAL

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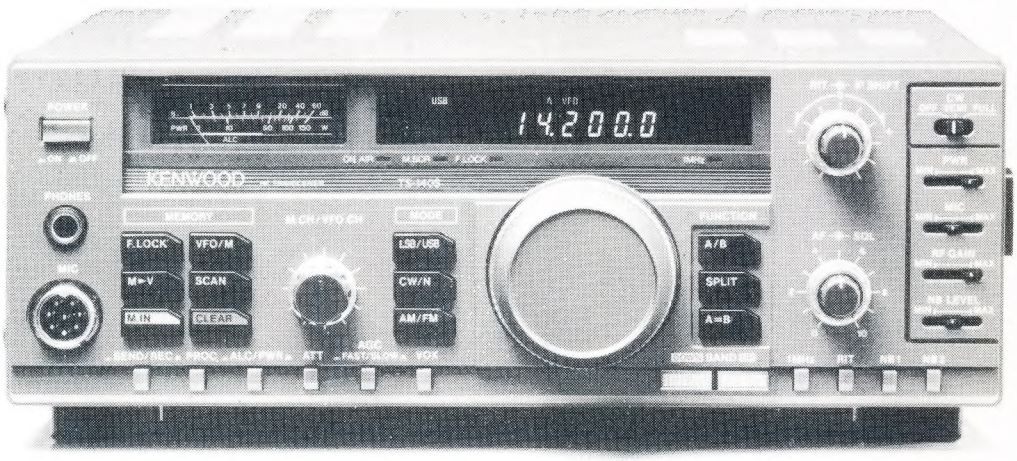


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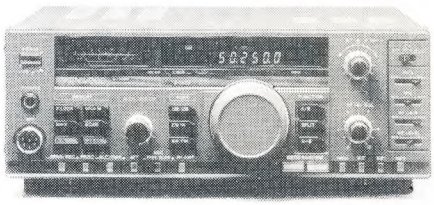

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AMATEUR RADIO

THE WIA RADIO AMATEUR'S JOURNAL

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## Cover

In recognition of the assistance given by Aussat to JOTA, this month's cover has an Aussat theme. Derek Reuther VK5AGZ is pictured at Aussat's' Regency Park earth station in Adelaide. Derek is holding an ICOM IC-2SA 2m hand held and a coaxial dipole in his right hand. His other hand displays the Amateur to Aussat interface and an ICOM IC-228A 2m rig. Both transceivers were supplied on loan by ICOM for the JOTA event. Photo by Peter Koen

# (GUEST) EDITOR'S COMMENT

ALYN MASCHETTE VK6KWN PRESIDENT VK6 DIVISION

## A Western Outlook

The New Year is imminent, so let's review our approach to amateur radio and what "we" can do for it.

Often on the air we hear the words "THEY should do something about it". We must realise that there is no "THEY", only "WE". We, the members, make up the Divisions. We, the Divisions, make up the Institute. It is only "WE" who can address and implement those items, actions or policies which others think "THEY" should do.

What have "THEY", the Federal body, achieved in the recent past? They have greatly updated the computing power of the Federal Office. The resulting improvement in managerial efficiency has permitted the 1991 Federal fee component to be raised by only $1 per member, much less than the increase in Consumer Price Index.

Some people think we should have uniform membership of a central Institute, and that in all States there should be uniform benefits and services. This would result in uniform fees for all, and thereby, say some, better Federal Office efficiency. With continually improving computer capability, is this still a problem?

Why do Divisional fees differ? Does VK3, with one of the highest subscriptions, provide more or better services than VK6, with the lowest? All Divisional Councils have to balance the books, and it is very true that "you get what you pay for". Let's look at two services common to all States: Repeaters, and the QSL Bureau. VK3 supports a number of repeaters, paying licence fees and running costs. VK6 pays only for those repeaters directly coupled into the Divisional news broadcasts. VK6 repeaters generally are controlled and financed by a separate incorporated body (the WA Repeater Group) which repeater users are free to join, *for an additional subscription.*

Other separate and distinct bodies cater for Digital Operators (RTTY and RTTY Repeaters, Packet and Digipeaters) and VHF/UHF operators. The WA VHF Group Inc runs its own business and controls the VHF and UHF beacons. Members of these bodies may or may not also be WIA members. About 60 per cent are.

Now, to compare QSL Bureau services. VK3 offers both inwards and outwards card movement free. VK6 has just revised its outwards charges to compensate for the 480 per cent rise in postage costs over the past five years so that the Bureau will again be user-sustained.

Who can say whether either Division has it right or wrong? One Division charges all members for services whether they use them or not. The other provides the required service, but on a "user pays" basis.

Let your Divisional Council know how "You", the "We" of the Institute want your Division run. By doing so you are also providing input to the Federal body which works for us all. A Merry Christmas to all of "You" from all of "Us". **ar**

## Amateur Radio Service

A radiocommunication service for the purpose of self-training, intercommunication and technical investigations carried out by amateurs, that is, by duly authorised persons interested in radio technique solely with a personal aim and without pecuniary interest.

# Wireless Institute of Australia

The world's first and oldest National Radio Society - Founded 1910

Representing Australian Radio Amateurs - Member of the International Amateur Radio Union

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# WIA NEWS

FROM THE WIA EXECUTIVE OFFICE

## 1991 Membership Fees

Although cyclic billing was introduced several years ago, the membership renewal date for the majority of WIA members is still the 1st January each year. During the first week of December 1990, 4650 WIA members will receive membership subscription renewal notices in the post.

Please renew your WIA membership promptly by cheque or credit card. If renewing by authorising the WIA to debit your plastic card, please carefully check your credit card numbers on the renewal slip, and ensure that you sign the authority before returning it to the Executive office. At this stage, credit card renewal of membership by telephone or by fax is unacceptable.

Each year more and more WIA members are realising the advantages in taking out a three year membership renewal. Unless you are a student member, or are not resident in Australia, think about renewing for three years. All you have to do is to forward a remittance for an amount equal to three times the renewal amount shown on the membership renewal notice. But please note, two year memberships are not available!

Also please note that receipts are not issued for membership renewals unless your remittance is accompanied by a request for a receipt and a self addressed stamped envelope.

WIA membership fees are reviewed once a year. As members will have heard on their Divisional broadcasts, the 1991 Divisional membership fees have increased by small and varying amounts over the 1990 fees. A list of the 1991 fees is shown in the WIA Divisional directory on this page (immediately below).

Because of the successful implementation of a number of cost cutting strategies, the Federal component of the 1991 WIA membership fee has only increased by $1.00, well below the expected CPI increase.

As a matter of interest, the break up of the Federal component of the 1991 membership fee is as follows:

### Full member

| | |
|---|---|
| Amateur Radio magazine | $31.00 |
| Executive | $16.25 |
| IARU component | $ 0.75 |
| International levy | $ 2.00 |
| | $50.00 |

### Pensioner and Student member

| | |
|---|---|
| Amateur Radio magazine | $24.80 |
| Executive | $12.85 |
| IARU component | $ 0.75 |
| International levy | $ 1.60 |
| | $40.00 |

# WIA DIVISIONS

The WIA consists of seven autonomous State Divisions. Each member of the WIA is a member of a Division, usually their residential State or Territory, and each Division looks after amateur radio affairs within their State.

| Division | Address | Officers | | | Weekly News Broadcasts | 1991 Fees |
|---|---|---|---|---|---|---|
| VK1 | ACT Division<br>GPO Box 600<br>Canberra ACT 2601<br>Phone (06) 247 7006 | President<br>Secretary<br>Treasurer | Ted Pearce<br>Jan Burrell<br>Ken Ray | VK1AOP<br>VK1BR<br>VK1KEN | 3.570 MHz<br>2m ch 6950<br>70cm ch 8525 2000 hrs Sun<br>(R Denotes repeater) Times 1045 and 1915 on Sunday | (F) $67.50<br>(G) (S) $54.00<br>(X) $40.50 |
| VK2 | NSW Division<br>109 Wigram St<br>Parramatta NSW<br>(PO Box 1066 Parramatta) 2124<br>Phone (02) 689 2417<br>Fax (02) 633 1525 | President<br>Secretary<br>Treasurer<br>(Office hours | Roger Henley<br>Tim Mills<br>David Horsfall<br>Mon-Fri 1100 - 1400<br>Wed 1900 - 2100) | VK2ZIG<br>VK2ZTM<br>VK2KFU | 1.845 MHz AM, 3.595 AM(1045) SSB (1915 only), 7.146 AM (1045 only) 10.125 SSB (1045 only), 28.320 SSB, 52 120 SSB 52.525 FM 144.12 (SSB), 147.000 FM(R) 438.525 FM(R) 584.750 (ATV Sound) 1281.75FM (R) Relays also conducted via many repeaters throughout NSW. | (F) $65.00<br>(G) (S) $52.00<br>(X) $38.00 |
| VK3 | Victorian Division<br>38 Taylor St<br>Ashburton Vic 3147<br>Phone (03) 885 9261 | President<br>Secretary<br>Treasurer<br>Office hours 0900-1600 Tue & Thur | Jim Linton<br>Barry Wilton<br>Rob Hailey | VK3PC<br>VK3XV<br>VK3XLZ | 1.840 MHz AM, 3.615 SSB, 7.085 SSB, 147.250 FM(R) Mt Macedon, 147.225 FM(R) Mt Baw Baw 146.800 FM(R) Mildura, 438.075 FM(R) Mt St Leonard 1030 hrs on Sunday | (F) $69.00<br>(G) (S) $55.00<br>(X) $42.00 |
| VK4 | Queensland Division<br>GPO Box 638<br>Brisbane Qld 4001<br>Phone (07) 284 9075 | President<br>Secretary<br>Treasurer | Murray Kelly<br>Eddie Fisher<br>Eric Fittock | VK4AOK<br>VK4ABX<br>VK4NEF | 1.825, 3.605, 7.118, 10.135, 14.342, 18.132, 21.175, 24.970, 28.400, MHz 52.525 regional 2m repeaters and 1296.100 0900 hrs Sunday Repeated on 3.605 & 147.150 MHz, 1930 Monday | (F) $67.50<br>(G) (S) $54.00<br>(X) $40.50 |
| VK5 | South Australian Division<br>34 West Thebarton Rd<br>Thebarton SA 5031<br>(GPO Box 1234<br>Adelaide SA 5001)<br>Phone (08) 352 3428 | President<br>Secretary<br>Treasurer | Rowland Bruce<br>John McKellar<br>Bill Wardrop | VK5OU<br>VK5BJM<br>VK5AWM | 1820 kHz 3.550 MHz, 7.095, 14.175, 28.470, 53.100, 145.000, 147.000 FM(R) Adelaide, 146.700 FM(R) Mid North, 146.900 FM(R) South East, ATV Ch 34 579.00 Adelaide, ATV 444.250 Mid North (NT)3.555, 146.500, 0900 hrs Sunday | (F) $67.50<br>(G) (S) $54.00<br>(X) $40.50 |
| VK6 | West Australian Division<br>PO Box 10<br>West Perth WA 6005<br>Phone (09) 388 3888 | President<br>Secretary<br>Treasurer | Alyn Maschette<br>John Farnan<br>Bruce Hedland - Thomas | VK6KWN<br>VK6AFA<br>VK6OO | 146.700 FM(R) Perth, at 0930 hrs Sunday, relayed on 3.560, 7.075, 14.115,14.175, 21.185, 28.345, 50.150, 438.525 MHz Country relays 3582, 147.350(R) Busselton 146.900(R) Mt William (Bunbury)147.225(R) 147.250 (R) Mt Saddleback 146.725(R) Albany 146.825(R) Mt Barker Broadcast repeated on 3.560 at 1930 hrs. | (F) $59.00<br>(G) (S) $47.50<br>(X) $32.00 |
| VK7 | Tasmanian Division<br>148 Derwent Ave<br>Lindisfarne TAS 7015 | President<br>Secretary<br>Treasurer | Tom Allen<br>Ted Beard<br>Peter King | VK7AL<br>VK7EB<br>VK7ZPK | 146.700 MHz FM (VK7RHT) at 0930 hrs Sunday relayed on 147.000 (VK7RAA), 146.750 (VK7RNW), 3.570, 7.090, 14.130, 52.100, 144.100 (Hobart) Repeated Tues 3.590 at 1930 hrs | (F) $65.00<br>(G) (S) $52.00<br>(X) $38.00 |
| VK8 | (Northern Territory) is part of the VK5 Division and relays broadcasts from VK5 as shown (received on 14 or 28 MHz). | | | | | |

**Note: All times are local. All frequencies MHz.**

**Membership Grades**
**Full (F) Pension (G)**
**Needy (G) Student (S)**
**Non receipt of AR (X)**

**Three year membership available to (F) (G) (X) grades at fee x 3 times**

## Non-AR member

| | |
|---|---|
| Amateur Radio magazine | $ 0.00 |
| Executive | $20.25 |
| IARU component | $ 0.75 |
| International levy | $ 2.00 |
| | $23.00 |

The Executive component of the Non-AR member fee includes an additional $4.00, which is the cost of maintenance of the member's records not recovered from the Amateur Radio component.

## WIA QSL Card Collection

As most amateurs know by now the WIA, as part of its aim to record and preserve the history of amateur radio in Australia, is building up an extensive QSL card collection. These cards, while being historical material in their own right, also contain information on the history of amateur radio and are available for use by members for that purpose. It is important that QSL cards are saved for the future and not discarded.

The Honorary Curator of the WIA QSL Card Collection, Ken Matchett, VK3TL, is pleased to receive donations of small or large quantities of QSL cards. Of course rare DX, special prefixes, or pictorial cards are most in demand, but use can be made of VKs, USA, and even JA cards. Please remember this if you are helping the family of a Silent Key, and ensure that the WIA collection benefits.

All contributions are acknowledged both by letter and in Amateur Radio magazine. Contact Ken at PO Box 1, Seville, Victoria, 3139, or by telephone on (059) 64 3721. Arrangements can be made for consignment of large quantities of cards.

## Band Plan Booklets

In the WIANEWS column in the July 1990 issue of Amateur Radio magazine, the WIA advised of the availability of the newly published booklet *"Band Plans for the Amateur Radio Service"*.

Those who have noted the five pages of Band Plans in the 1991 Australian Radio Amateur Call Book may wonder at the need for a separate booklet. However, a quick inspection shows that the booklet contains a lot more than just the bare band plans. It includes information on the history and philosophy of band planning agreements, definitions of terms and bandwidths, notes on DoTC or international specifications for particular bands and modes, and more detail on specific frequencies within the bands.

For those who have already purchased the booklet, an update sheet detailing the latest amendments is available on receipt of a request accompanied by a self addressed, stamped envelope.

This very informative booklet, the WIA "Band Plans for the Amateur Radio Service", is available from the Executive Office for a mere $2.80 including handling and postage. But be quick. Supplies if this booklet are dwindling fast.

## National Parks - An Allegory

In the course of recent conversation, Murray Kelly VK4AOK, the newly elected president of the Queensland Division of the WIA, queried what sort of response would come from pushing the WIA as the defender of the National Parks of the Radio Frequency Spectrum?

In response to the challenge to *"put pen to paper"*, this is what Murray wrote:

*"Once upon a time everyone believed that there was no more of the world left to discover. All the new Kingdoms were fixed and their people were happy. Except for a few, that is. These few, citizens of various kingdoms, were not content and wondered what was behind the mountains that all the lands of the world surrounded. A little group went to explore, indifferent to the taunts that they were crazy. The explorers discovered, to everyone's surprise, that there was a large tract of land behind the mountains, and since it was in the middle of the kingdoms, belonged to all of them.*

*The Princes of the Kingdoms immediately claimed joint sovereignty over this new land so that it could only be used for "useful" things like industry, commerce and farming. The explorers were told they could only roam in the seemingly barren higher ground called "200 & DOWN". Nobody could see any use for it - let the explorers have it.*

*Soon the explorers reported that "200 & DOWN" was a place of great promise - indeed, better than anything found so far. The Princes moved quickly. The whole new land was claimed for industry, commerce and farming except for some small pieces called National Parks, where ordinary citizens could go - to picnic, exercise, explore some more, or whatever took their fancy - all for a small fee to cover upkeep.*

*Industry, Commerce and Farming were consumed with jealousy that these perfectly good places were wasted by excluding them. They wanted all the land for themselves. Only by organising their voices as one were the citizens able to protect these tiny tracts from those greedy eyes. So they set up and gave money to a Council whose task was to keep a watchful eye on the Parks. Thus their voice was heard and the parks were declared in perpetuity by the Princes.*

*The Amateur Bands are the National Parks of the Radio spectrum.. A good National Parks policy tries to set aside 10% of the land for the use of its citizens for recreation, exercise, exploration and conservation. A small fee is charged to enter. The Amateur Bands fit this picture. The entrance fee is the exam. We go to our favourite spot to ragchew, foxhunt, experiment or just "sandbag on the side". Commercial interests look wistfully at the areas set aside for Amateurs. They think they are a waste of a resource that would make them a profit - that no constructive use is made of them.*

*Unlike National Parks our bands are not set aside in perpetuity by acts of law. At the stroke of a pen they can be, and often are, re-allocated.*

*Every country of the world has but one voice representing their interests at the great council controlling the Radio Spectrum. This council is the ITU, and amateurs have a say in its deliberations about RF National Parks through the IARU, the combined voices of amateurs throughout the world.*

*The exclusive Australian voice is the WIA. Do you support it? In 1992 the land will again be divided up and the Parks will possibly get even smaller unless all the citizens get together and cry out against such a happening.*

*If you do not belong to the WIA your monetary contribution will be sorely missed, as it will cost dearly to send our representatives to WARC 92. If you are one of those who used to use the Parks, keeping your ticket and planning to return soon when things get quiet at the office, just think what your reaction will be when you turn up at your favourite spot - and find there a supermarket or a factory! Your lovely Park will have been developed.*

*Radio Amateurs have lost spectrum in the last couple of years - who is game to say we won't lose more? Any contribution to the WIA WARC 92 fighting fund will help save the RF National Parks.*

***THINK ABOUT IT!"***

## Contest Rules

The WIA manages four major contests each year (Ross Hull Memorial, John Moyle Field Day, Remembrance Day and VK Novice), and the VK/ZL/Oceania contest every second year. The specific rules for each contest are published in

# PRESIDENT'S SEASONAL MESSAGE

PETER GAMBLE, VK3YRP FEDERAL PRESIDENT

As we come to the end of another year, it is interesting to pause for a few moments and look at the achievements of the past year - and indeed the past few years. From where I view the WIA there have been many changes and I believe that they have generally improved the service to you, the member.

Firstly, the efficiency and responsiveness of the Executive Office have improved considerably, due to the hard work - both physical and mental - by Bill Roper and his office team. The changes that he has introduced have resulted in a more effective operation of the WIA at a Federal level.

Secondly, the changes in the organisation have developed a new sense of co-operation between the Divisions. Instead of meeting together just once a year for the Federal Convention, representatives from each Division now meet four times a year. The majority of the time at these weekend meetings is spent as the Federal Executive, with the remaining time being spent as the Federal Council meeting in convention. This has resulted in the speeding up of much of the policy making process of the WIA.

However, I believe it has also had a much more beneficial effect on the WIA as a whole. As representatives from each of the seven Divisions sit around the table together, a team spirit develops. In the early days of these meetings (eighteen months ago!) it took a while for this to develop whereas now it happens quite quickly. The result is that there is more understanding of the unique situations that occur in particular areas and a greater willingness to see the other person's point of view. It also means that the decisions made reflect the inputs from a wider range of views. Occasionally things don't go quite the way they should. The new organisation enables these problems to be detected quickly and ensures that appropriate steps can be taken to rectify the situation.

Finally, there have been great changes in the regulatory environment. "Deregulation" is the word in many government circles these days, including amateur radio. The WIA believes that this is a positive step, after all our hobby is intended to be "self-regulating". However, this process is not without its difficulties.

What does the New Year hold for amateur radio?

There are many positive things that we will continue to work for. These range from further deregulation of our hobby in various areas, such as packet radio, repeaters, third party traffic and reciprocal arrangements with other countries, to preparation for the coming WARC.

The requirements of the Amateur Service for spectrum space are simple and not excessive. It is only courtesy that these be given full consideration when spectrum planning decisions are made. To ensure that our position is well known, the WIA is taking an active part alongside other spectrum users in the national process that will determine Australia's position at WARC 92.

Other activities of the Federal Council will include the ongoing review of the WIA to make sure that membership services continue to be provided in an effective and efficient manner. Existing policies will be reviewed to ensure that they are relevant and up-to-date.

It is also useful to reflect on the mission statement developed as part of the WIA's corporate planning activities:

To promote and advance amateur radio locally, nationally and internationally in a way which:

- Meets member and community needs;
- Encourages the maintenance of standards; and
- Positions this organisation as the representative voice of amateur radio enthusiasts in Australia.

(AR, April 1989)

To achieve this goal, we need your help. Are we meeting your needs as a member? Are we providing the services that you need? If you have never talked or written to a member of your Divisional Council or your Federal Councillor to explain your point of view, why don't you try it! They are just other ordinary amateurs like you and I - anxious to do the best possible things for our hobby.

In conclusion, on behalf of the members of the Federal Executive and the staff of the Executive Office, I would like to extend Seasons Greetings to you and may 1991 be a challenging year that extends your amateur radio horizons.

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Amateur Radio magazine prior to each contest, but there are also general rules applicable to all contests.

Neil Penfold VK6NE, the acting Federal Contest Co-ordinator, has recently reviewed these general rules in conjunction with several other parties. Here are the parts of main interest to contesters.

CONDITIONS OF CONTEST ENTRY

(i) Entrants must operate in accordance with the terms of their licence;

(ii) Each entrant agrees to be bound by the provisions, as well as the intent, of these general rules and the specific rules published for each contest; and

(iii) All entries become the property of the WIA and, in the event of a dispute, the ruling of the Federal Contest Co-ordinator shall be final.

CLASSES OF CONTEST ENTRANT

(i) A single operator station is one manned by a single operator.

(ii) For certain contests multi-operator entries are permitted. These entries will be accepted subject to the contest declaration form being signed by one operator who then becomes the entrant and is responsible for the entry. The entrant is required to ensure that the operator's callsign is shown in the log for the entry for each contact, or group of contacts, made by that operator and that the contest rules have been observed. Failure to observe these requirements will result in the entry being disallowed.

CONTEST ENTRY PROCEDURES

(i) Each entry will consist of a contest log, a cover sheet, and a summary sheet. The cover sheet, which may include the summary sheet, must include a statement that the rules and spirit of the contest have been complied with;

(ii) Logs must be kept, and entries submitted, in UTC; and

(iii) Any log that is incomplete or illegible will not be accepted as an entry.

CONTEST DISQUALIFICATION CRITERIA

(i) An entry will be disqualified if, upon checking the logs, it is necessary that the overall score be reduced by more than two percent. Score reduction will not include

correction of arithmetic errors. However, reductions may be made for unconfirmed contacts or multipliers, duplicate contacts, or other scoring discrepancies.

(ii) For each duplicate or mis-copied callsign removed from the log by the Contest Manager, a penalty consisting of the deletion of three additional contacts, of equivalent value to the offending claim, may be applied. This penalty will not be considered as part of the two percent disqualification criterion.

(iii) Logs which are very untidy, or illegible to a major degree, may also be disqualified.

## RF Tag Devices

The subject of RF tag devices has featured in the WIANEWS column several times in recent months. The WIA received several letters from members and non-members on the matter. News was published on how DoTC had approached the WIA to seek its views on using low power devices in the Australian 80 metre band, as well as several other bands ranging from VLF to microwave.

The most recent WIANEWS item described the successful negotiations which saw a decrease in 80 metre device emitted field strength by 24 dB to a level equal to the *"quiet rural"* man made noise level as given by CCIR Report 258-4. Mention was also made that the WIA was seeking an Australian DoTC ministerial standard for these devices.

A letter recently received from DoTC states that since RF tags are unprotected and unco-ordinated, DoTC intends to issue frequency and power limit specifications for each band, rather than a standard. The letter stated the revised field strength requirement for the 3.5 - 3.7 MHz band devices was accepted by one Australian company developing RF tags, but was too low for many proposals made to DoTC, hence they would not expect a proliferation of devices in that band.

The potential world market for international freight tag systems is very large and DoTC presume it will percolate into domestic use as well. They expect the international system to be in either the 400 MHz or 900 MHz bands. The WIA WARC 92 Australian Preparatory Group (APG) team have taken note of this point.

The WIA was also asked by some members what were the implications for devices imported as adjuncts to international cargo containers. DoTC have responded that an internationally agreed standard should eventuate, noting Standards Australia has formed a new committee TE/19 - Automatic Electronic identification (AEI) to continue the work previously done in TE/14/4.

From a Standards Australia letter of June this year it appears that group TE/14/4, working on behalf of the Telecommunications and Electronics Standard Board, TE/14, was responsible for drafting AS 2361, Freight containers - Automatic identification - Operating parameters (now published) and for liaison with the International Standards Organisation (ISO/TC 104/WG 3). The WIA will now obtain a copy of that Australian Standard and if necessary seek membership of the TE/19 committee.

One point this issue has made abundantly clear is the need for the WIA to have technically competent members who can monitor the activities of the Standards Association, amongst other agencies. This is a field of activity where the WIA is in need of further assistance. Can you help?

## Quarterly Executive and Council Meeting

The latest quarterly meeting of the WIA Executive and Federal Council took place over the weekend of 13th and 14th October 1990. Delegates from the seven state Divisions which make up the WIA came to the Executive Office in Melbourne for two full days of intensive discussion and decision making.

Literally dozens of matters were tabled, and the minutes, and attachments, of the Executive meeting alone totalled 29 pages.

Just some of the discussions over this busy weekend included the following:

Five pages of WIA membership statistical analysis were tabled and provoked considerable discussion on membership trends, and possible steps to be taken;

The resignation of Bill Wardrop VK5AWM was accepted from the position of Federal WICEN Co-ordinator. Leigh Baker VK3TP, a well known figure in WICEN, was appointed to replace Bill;

David Wardlaw VK3ADW, the WIA WARC 92 team leader, gave a comprehensive report on the current situation regarding the Australian WARC preparations and mentioned that, so far this year, he had attended over 20 official meetings regarding WARC 92, including both the Australian Preparatory Group and CCIR;

It was resolved that the WIA would send one member of the WARC 92 team to the Joint Interim Working Party (JIWP) in Geneva in March 1991, in addition to the WIA representation at WARC in 1992;

A paper seeking the relaxation of the identification requirements for packet networking protocols, submitted by John Martin VK3ZJC, the chairman of the Federal Technical Advisory Committee (FTAC), was approved and John was requested to prepare the WIA submission to DoTC on this important matter;

The recommendations by John Martin for changes to the Australian band plan, as detailed in recent issues of Amateur Radio magazine, were approved in full, and Executive recorded its appreciation to John for the procedures of consultation with WIA members which he used in preparing his recommendations;

A considerable number of proposed changes to the Articles of Association were approved for submission to the WIA's legal counsel for action;

Roger Harrison VK2ZTB was appointed to the position of Federal Standards Co-ordinator; and

Brenda Edmonds' VK3KT resignation from Executive was accepted prior to her taking up the position of assistant manager in the Executive office.

If you wish to know more about these Executive and Council meetings, contact your Divisional Federal Councillor.

You do not know who he is? Have a look on page two of Amateur Radio magazine.

## Club Recruiting Campaign

The current three month WIA radio club member recruiting campaign is attracting a lot of interest, and a number of clubs have already begun signing up club members as members of the WIA so that their club can benefit from the WIA offer.

Full details of this offer were in the WIANEWS column in the October 1990 issue of Amateur Radio magazine, and also in advertisements in the last three issues of the magazine.

Do not let your radio club miss out on this offer. It closes on 31st December 1990.

## WIA 80 Award

The WIA 80 Award was inaugurated to mark the 80th anniversary of the world's first and oldest national radio society, the WIA. This award is not an easy award to achieve. To date only 12 Australian amateurs have qualified for this award by working 80 members of the WIA.

The WIA 80 award finishes on 31st December 1990 so you only have a few weeks left in which to qualify. Full details were published in the WIANEWS column in Sep-

tember 1989 issue of Amateur Radio magazine.

Incidentally, overseas amateurs only had to work 8 members of the WIA. So far 51 overseas amateurs have qualified for the WIA 80 award.

## Management of the WIA Budget

Each year at this time, when the annual fees for WIA membership are set, and seem to be inexorably increasing, the question is generally asked, *"Does the WIA use modern management techniques for the derivation of its annual budget and to monitor progress against that budget throughout the year?"*

Whilst there are several means of program control, one that readily springs to mind is Program Management and Budgeting or PMB, recently introduced in all Commonwealth Government departments. It is against PMB that this comparison of WIA financial management is made.

PMB is an iterative or cyclic process; it begins with establishing the several goals to be achieved during the year. The resource costs necessary to achieve these goals are estimated using normal, readily identified classifications and frequently the total costing for each goal or activity is determined. The summation of all activities constitutes the program which often, at this first round stage, exceeds the funds available. A process of review or cost cutting, and sometimes activity cutting, now takes place to establish the final budget or planning base.

How does this relate to the WIA? Well, each year the General Manager drafts a first budget, using best estimates from past achievements and incoming advice of new or changing activities. Executive meets to discuss each item, agree or adjust its size and go around the budgeting cycle to match the anticipated outgoings to expected income, whilst retaining a healthy surplus.

Much has been said about budget surpluses. However, it remains a fact that capital procurement in an organisation like the WIA must be funded from accumulated surpluses. Consequently Executive, on advice from the General Manager, now aims to create a budget surplus of around 5% of income each year. In the past a series of loss budgets and end of year financial loss circumstances has sadly depleted the WIA accumulated funds to only a very few dollars.

PMB aims to identify, within the total program, a series of sub-programs or discrete activities, and within sub-programs a series of components or lesser activities.

Obviously the three parts of the Federal subscription and the international representation levy define four sub-programs.

Desirably the financial health of all sub-programs should be readily available and managed in real time. For example, a reduction in Amateur Radio advertising leads to issues of the magazine with fewer pages. This is necessary for the pages are no longer required for advertisements and the advertising income is not available to support pages of editorial content. Hence the WIA balances the Amateur Radio progressive budget on an issue to issue or monthly basis but, due to lead times, it's usually a month in arrears!

The current financial reporting system employed in the Executive Office records by head of expenditure postage, rent, salaries etc., rather than by sub-program, although the Amateur Radio magazine, and many other components, are set up and available from the system.

However, all these financial reporting systems are only part of the total WIA management information system. What has been considered only fleetingly above is the derivation and agreement of the activities which give rise to the program components discussed above. For example,


# MAGPUBS

### HANDBOOKS

| | | |
|---|---|---|
| ARRL 1990 Handbook ARRL Hard Bound | #BX287 | $52.90 |
| The Operating Manual ARRL | #BX192 | $30.00 |
| The ARRL Electronics DATA BOOK ARRL | #BX201 | $24.00 |
| Radio Data Reference Book G.R. Jessop RSGB | #BX189 | $36.00 |
| Radio Communication Handbook Fifth Edition RSGB | #BX266 | $56.00 |
| Radio Handbook 23rd Edition William I. Orr W6SAI | +#BX22424 | $59.50 |
| Motorola RF Device Data Motorola 5th Edition 2 Book Set | #BXS047 | $24.50 |

### ANTENNA BOOKS

| | | |
|---|---|---|
| The ARRL Antenna Handbook 15th Edition | #BX161 | $36.00 |
| Antenna Compendium Volume 1 ARRL | #BX163 | $22.00 |
| Antenna Compendium Volume 2 ARRL | #BX292 | $24.00 |
| Antenna Compendium Volume 2 & IBM PC Disk ARRL | + #BX294 | $36.00 |
| Antenna Impedance Matching ARRL | #BX257 | $30.00 |
| Yagi Antenna Design ARRL | #BX164 | $30.00 |
| WIFB's Antenna Notebook Doug DeMaw ARRL | #BX179 | $20.00* |
| Novice Antenna Notebook Doug DeMaw ARRL | #BX162 | $16.00 |
| Practical Wire Antennas John D. Heys G3BDQ RSGB | #BX296 | $28.00 |
| HF Antennas L.A.Moxon G6XN RSGB | #BX188 | $28.00 |
| ANTENNAS 2nd Edition John D. Kraus W8JK | #BX259 | $104.00 |
| Antenna Handbook William I Orr W6SAI & Stuart D Cowan W2LX | #BX217 | $17.30 |
| Vertical Antenna William I Orr W6SAI & Stuart D Cowan W2LX | #BX220 | $15.85 |
| Beam Antenna Handbook W I Orr W6SAI & S D Cowan W2LX | + #BX215 | $19.30 |
| Wire Antennas William I Orr W6SAI & Stuart D Cowan W2LX | #BX218 | $17.30 |
| Cubical Quad Antennas W I Orr W6SAI & S D Cowan W2LX | #BX214 | $14.50 |
| The truth about CB Antennas W Orr W6SAI & S D Cowan W2LX | #BX219 | $17.30 |
| Transmission Line Transformers J Sevick W2FMI New 2nd Ed | BX329 | $40.00 |

### PACKET RADIO BOOKS

| | | |
|---|---|---|
| Gateway To Packet Radio Stan Horzepa WA1LOU 2nd Edition | + #BX169 | $24.00 |
| The Packet Users Notebook Buck Rogers W4ABT CQ | #BX285 | $18.50 |
| Packet Radio is Made Easy Buck Rogers W4ABT MFJ | #MFJ32 | $20.50 |
| AX.25 Link Layer Protocol ARRL | #BX178 | $16.00 |
| Computer Networking Conferences 1 - 4 1981 to 1985 ARRL | #BX166 | $36.00 |
| Computer Networking Conferences 5th 1986 ARRL | #BX167 | $20.00 |
| Computer Networking Conferences 6th 1987 ARRL | #BX168 | $20.00 |
| Computer Networking Conferences 7th 1988 ARRL | #BX184 | $25.00 |
| Computer Networking Conferences 8th 1989 ARRL | #BX295 | $24.00 |
| SPECIAL — All 5 Books — Conferences 1 to 8 | —#BXS006 | $80.00 |

### VHF/UHF/MICROWAVE

| | | |
|---|---|---|
| RSGB Microwave Handbook Volume 1 M W Dixon G3PFR RSGB | #BX318 | $70.00 |
| VHF-UHF Manual George Jessop G6JP RSGB | #BX267 | $48.00 |
| all about VHF amateur Radio William Orr W6SAI | #BX216 | $17.30 |
| 21st Central States VHF Conference 1987 ARRL | —#BX172 | $17.50 |
| Mid-Atlantic VHF Conference Oct 1987 ARRL | —#BX175 | $17.50 |
| 22nd Central States VHF Conference 1988 ARRL | —#X173 | $17.50 |
| 23rd Central States VHF Conference 1989 ARRL | —#BX286 | $17.50 |
| Microwave Update 1987 Conference ARRL 1987 | —#BX174 | $17.50 |
| Microwave Update 1988 Conference ARRL 1988 | —#BX183 | $17.50 |
| Microwave Update 1989 Conference ARRL 1989 | #BX321 | $24.00 |
| UHF Compendium Part 1 & 2 Volume 1 | #BX250 | $49.95 |
| UHF Compendium Part 3 & 4 Volume 2 | #BX251 | $49.95 |

### General Interest

| | | |
|---|---|---|
| Hints & Kinks For The Radio Amateur ARRL | #BX330 | $16.00 |
| The Short Wave Propagation Handbook G. J. Jacobs & T J Cohen | #BX268 | $18.50 |
| Morse Tutor GGTE ARRL 5¼" IBM Disk | #BX187 | $20.00 |
| Low Band DXing John Devoldere ON4UN | #BX195 | $20.00 |
| Transmitter Hunting Joseph D. Moell TAB | #BX222 | $35.90 |
| Radio Frequency Interference How to Idenitify & Cure It ARRL | #BX186 | $9.50 |
| Interference Handbook William R. Nelson Radio Publications | #BX181 | $17.80 |
| Goldern Classics of Yesteryear Dave Ingram W4TWJ | #MFJ-30 | $20.50 |
| The Complete DX'er 2nd Edition Bob Locher W9KNI | #BX194 | $20.00 |
| Solid State Design For The Radio Amateur DeMaw W1FB ARRL | #BX171 | $24.00 |
| Amateur Radio Awards Book RSGB | #BX297 | $30.00 |

**The above books, plus many more, are available from your WIA Divisional Bookshop. All items are less 10% discount for WIA Members and are plus postage and handling where applicable.** All Prices are Subject To Change With-out NOTICE

If not in stock at your Divisional Bookshop, your order will be taken and filled promptly. Not all publications are available from all Divisions. * Price Changes .. —# price Reduced .. + Price Increase

what are the WIA WARC 92 and Australian Preparatory Group (APG) proposed activities which are funded by the international representation levy? Fortunately, this example is one which has been defined in some detail, discussed by Council and Executive, and agreed.

Broadly speaking, the WIA aims to be represented at all relevant APG activities by at least one delegate and proposes to send one representative to the Joint International Working party in Geneva in March 1991 and at least one representative to Spain in 1992 as member of the national delegations. But can the WIA be as specific for the Publications sub-program? For the Call Book, yes. The WIA intends to publish, at a reasonable profit, an annual Call Book for as long as the WIA holds the contract to do so from the Australian Government Publishing Service (AGPS). However, the WIA is not so definite in its aims for Amateur Radio magazine, although you will have noticed from WIANEWS the Publications Committee is concentrating on this matter.

One could conclude that the financial management side of the WIA is well on the way to providing the information the Executive, as managers, require. However, the directions to Executive on what is required by and for the members is not yet set in concrete. Federal Council will be devoting some time in early 1991 to defining succinctly the activities the WIA should be carrying out, and arranging them in priority order. To do this, however, the Council needs to complete the agreement on what will be done centrally in the Executive Office, and what will be done in the Divisions. This part of the Corporate Plan is due for completion shortly and will make the management of the WIA much clearer and easier.

## IARU Region 3 Conference Agenda

Ron Henderson VK1RH, the WIA IARU Region 3 Liaison Officer, advises that it is fast approaching time to consider what matters the WIA wishes to see raised at the coming IARU Region 3 Conference to be held in Bandung, Indonesia during October 1991. The agenda used at the last Region 3 conference, excluding reports by member societies, management and procedural items, was as follows: (Ron believes that the items marked * could be potential inputs from the WIA.)

POLICY MATTERS
- *Bandplans
- *Use of bands in Region 3
- ITU conferences and events
- Improvements in IARU Constitution and Bylaws
- IARU representation by a member society
- *Amateur radio licence
- *Electro-magnetic compatibility
- Amateur satellite
- Promotion of amateur radio in developing countries
- Region 3 News

OPERATING MATTERS
- *IARU monitoring service
- Intruders in amateur bands
- *International beacons
- Amateur Radio Direction Finding
- Contests
- *QSL cards and QSL services
- *Packet radio
- *Technical and operational standards of other modes
- Emergency communications
- *Station identification by alien amateur
- World amateur day

THE CONSTITUTION OF THE ASSOCIATION
- *Proposals for change
- Proxies

THE GENERAL REGULATIONS OF THE ASSOCIATION

THE FINANCES OF THE ASSOCIATION

At the October 1990 WIA Executive meeting a number of topics were flagged for inclusion in the 1991 IARU Region 3 Conference. The WIA's IARU liaison officer would be grateful to receive further contributions which can be sent through your Divisional Federal Councillor or direct to the Executive Office.

- *Intruder Watch - intruders from the north (raised by VK8 amateurs)
- *Pacific Rim licence - maritime mobile implications (raised by VK4 and VK3)
- *Regional Society structure - including treasurer (raised by WIA IARU liaison officer.)
- *Funding system for Region 3 (raised by the Executive)
- *RF tag devices (raised by WIA IARU liaison officer)
- *Band plans - notify ours (raised by the Executive)
- *Bands - usage nationally and internationally (also raised by Executive)
- *Third Party Traffic status update (raised by the Executive.)
- *Packet radio - national update (raised by FTAC)
- *Packet radio - SYSOPS code of ethics (raised by the Executive)
- *Packet radio - planning considerations (raised by FTAC & Executive.)

The usual procedure is for a well informed amateur to draft a short (1 or 2 page) paper on the topic, with conference recommendations if necessary. Executive then reviews and clears all papers for dispatch to Region 3 for reproduction and circulation well prior to the actual Conference. This suggests a June 1991 deadline if the WIA is to achieve maximum impact by having its views circulated and discussed by regional societies in advance of the meeting proper.

As noted above, if you have something to contribute to the next IARU Region 3 conference, please set down your ideas and get them in to the system as soon as practicable.

## Australian Spectrum Plan

The WIANEWS columns in the August and September 1990 issues of Amateur Radio magazine carried details of the WIA's submission to the Department of Transport and Communications (DoTC) in response to their call for comments on the draft Australian Spectrum Plan. The WIA, in its submission, made five major points concerned with:

- Designating more clearly the Amateur Satellite Service allocations;
- Elevating several segments in the amateur microwave bands to primary status in Australia;
- Extending the quite narrow 10 MHz band;
- Extending the 3.5 MHz band upwards to 3.9 MHz;
- Not placing fixed and mobile services in the 420 - 450 MHz band.

In its response DoTC did not accept the first four points but did revise the 420 MHz spectrum plan to ensure it continued to reflect the arrangements in the international table in this band. What this means is that amateurs will continue to be a secondary service in the full band 420 - 450 MHz, and be the only secondary service, with radiolocation as primary, in the segment 430 - 440 MHz which is designated amateur secondary in Regions 2 & 3.

Note that there are no international amateur allocations in the 420 - 430 and 440 - 450 MHz segments, but Australian amateurs have secondary allocations on these frequencies and continue to retain them as a result of the WIA submission.

On the Amateur Satellite Service, DoTC believed the inclusion of references to footnotes remained adequate to draw attention to these particular circumstances.

It is WIA policy to seek small amateur primary allocations within the larger secondary allocations in the microwave bands. These bids for primary segments generally align with the amateur satellite frequencies where orbiting space vehicles could interfere with other Australian allocations. This is a point the WIA has made strongly in the past. Indeed, quite recently,

attention was drawn to the potential problems should a SYLEDIS service be allocated in the 435 - 438 MHz satellite window. The WIA believes DoTC could have acknowledged these satellite windows, if not by making primary allocations to amateurs, then by ensuring no primary allocation was made in Australia so that the secondary amateur service remained in the clear. This point will not be allowed to rest.

The bid for increased allocation at 10 MHz, albeit a secondary band, follows from IARU stated policy developed over the last ten years since the amateur service gained this band at WARC 79. Again the WIA will continue to express this agreed viewpoint.

Unlike some of our neighbouring nations, who have a greater allocation ranging from 3.5 up to 3.9 MHz, we in Australia are confined to the segment 3.5 to 3.7 MHz with a narrow conditional DX window below 3.8 MHz. A number of amateurs, in monitoring the 3.7 to 3.9 MHz segment, have commented upon the appropriateness of the allocations made there.

DoTC stated in their reply that the segment is highly utilised providing fixed and mobile services in the Australian outback regions and to extend the band to amateurs would provide excessive congestion. The opinion has also been expressed by some amateurs that the segment is being used to relocate those services from elsewhere in the HF bands. The WIA's WARC 92 team are monitoring this issue for its HF broadcasting implications.

Executive seeks members' views on the appropriateness of the users of this segment and welcomes informed comments. A decision to pursue this matter further will depend upon the views expressed by members.

## HF
### Beacons

On the HF beacon scene international beacons exist or are proposed for the 14, 21 and 28 MHz bands. There may be others on the WARC bands but these are not part of the IARU international beacon project (IBP).

On 14.100 MHz there exists a worldwide, time sharing, power stepping series of beacons which had their origin in the North California DX Association initiatives a number of years ago. These beacons are all on that same frequency, however they time share and in so doing radiate at several stepped power levels. Although there is no Australian beacon in the series you can still hear them if you listen on 14.100 MHz.

The IARU has also reserved the frequency 21.150 MHz for a similar time sharing, power stepping, beacon series.

The 28 MHz system is more extensive, for there exists a large number of 10 metre beacons, each on its exclusive frequency. The IARU proposal is to allocate a much narrower band of frequencies for a series of time sharing beacons. One frequency will be allocated for a world wide series, very like the twenty metre and fifteen metre schemes. Other adjacent frequencies will be allocated on a continental basis for beacon series within the region served.

Australasia will be one such continental allocation and in time all our existing beacons (except the one on the world wide frequency) will change to that new frequency and become time sharing, power stepping, beacons. These proposals are covered in IARU Administrative Council Resolution 86-1.

There is also provision for special purpose, continuously emitting, beacons to be set up in a separate beacon segment but these would be expected to be few and far between.

As the into-service date for the new ten metre scheme was 1st January 1990, but was recently extended to 1st January 1993, you might well ask what is happen-


## VHF Communications Magazine

### 1991 Issues Will Be Available After All!

The VHF Communications Magazine will now be translated and published in the UK, and will be available through subscription with the WIA, the Australian agents.

**The 1991 prices are as follows:-**

| | |
|---|---|
| **Surface Mail** | **$35** |
| **Airmail** | **$48** |

**Please forward your cheque to WIA, PO Box 300, South Caulfield Vic 3162 before 31st January, 1991 to ensure you receive your first issue for 1991. Separate cheques for WIA subscription and VHF Communications Magazine renewal please.**



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ing? FTAC took action about a year ago to register Australia's interest in a beacon on the world wide frequency and a series on beacons on an Australasian frequency, but to date the WIA has heard nothing in reply from the IBP coordinator. FTAC has also recommended the Sydney location for the Australian beacon on the worldwide frequency.

The WIA knows the IBP coordinator has been requested to provide technical data on the construction of a simple beacon controller which can adequately keep time for lengthy periods in a range of temperatures and conditions. Some time standards are available for reference purposes such as WWV, VNG, ELF signals and television line timebase frequencies. What is needed is a design with suitable inherent stability, easily re-synchronised and with suitable control signals to both switch the transmitter, step its radiated power and provide the identification.

The chairman of FTAC has recommended we hasten slowly with the ten metre change over, for there is an extensive system of beacons in place in Australia and they occupy a segment of that band, thus denying it to intruders from our north. The new beacon band plan will reduce that occupancy and may not be to our immediate advantage. On the other hand the new band plan frees up some of the relatively narrow Australian novice segment for novice use. One of the driving factors for change in Australia could be a new demand for an exclusive beacon frequency.

## DX Foundation HF Beacons

Whilst discussing HF beacons, the latest ARRL Newsletter contains the following note on additional HF beacons:

*"There's a new look to the 14.1 MHz beacon system operated by the Northern California DX Foundation. In addition to the 14.1 signals transmitted by nine stations around the world, the Californian beacon, W6WX/B, has added signals at 21.150 and 28.2 MHz. These are activated after W6WX/B transmits on 14.1. This prototype 3-band beacon rig was designed and built by W6QHS and N6EK. The foundation hopes the other eight beacons can be upgraded to "tribanders" within a few years. Reports on the beacons are always welcome; send them to W6RQ."*

## VK/ZL Oceania DX Contest 1990

We reprint without comment a small item from the contest column of the August 1990 issue of "Radio Rivista", the monthly magazine of the WIA sister society in Italy, as translated by George Cranby, VK3GI.

*"The VK/ZL contest has never been seriously followed in Europe. In years of poor propagation the contest passes sometimes without realisation that it was "on". Only a few take note of the CW section.*

*New Zealanders and Australians, on their part, have never been serious contest followers. With the exception of a few stations which regularly take part in major contests there is not much doing.*

*I believe that the temperament of these people is not suited to the mental attitude of a contestant. They are perhaps more calm and relaxed, and more inclined to chit-chat than to a quick exchange of reports and the exchange of numbers. Might they be right."*

**Thanks are due to Brenda VK3KT, Ron VK1RH and George VK3GI for their assistance in compiling WIANEWS this month.**

**Merry Christmas and Happy New Year from Bill Roper VK3ARZ.**

ar

# WIRELESS MUSEUM, LINDFIELD, ENGLAND

Clive Wallis VK2DQE
3 Douglas Place
Miranda 2228

During a brief visit to England in July this year, quite by chance I came across the Wireless Museum at Lindfield, West Sussex. Though small, this museum contains an excellent collection of some 100 or more vintage wireless receivers dating from 1920 to 1960. Most are in working condition, and all are well restored. Some WW2 communications gear is on display, including an HRO, an 1155 and a CR100. Old amateur receivers are also on view and this section is presently being expanded. You can listen to a working crystal set and study an interesting display of old valves, amongst which is a Loewe 3NF built in Germany in 1926. This is actually three triodes, r-c coupled, and all mounted in one glass envelope with a special five-pin bayonet fitting base. Quite possibly it is the first commercially produced integrated circuit, requiring only the addition of a tuning circuit, power supply and headphones to create a detector plus two LF stage receiver! HT voltage was 90-200, filaments needed four volts. The idea was very advanced for its day and must have been a marvel of German technology, but apparently the individual filaments were liable to failure, and loss of any one meant that the entire device was ruined. Replacement would have been an expensive proposition in 1926!

Ray Leworthy, owner and curator, was a wireless mechanic in the RAF during the war years and was in India at the cessation of hostilities. He held a VU call and homebrewed his rig from "borrowed" parts courtesy of the air force. Finals would have been VT60s (valves transmitting type 60), better known outside the RAF as 807s!

Ray no longer holds a licence but still maintains an interest in the hobby. He extends a warm welcome to any amateur who drops in. Entrance is free, but a small donation towards upkeep is appreciated.

Lindfield is a delightful old village which lies on the eastern border of West Sussex, just NE of Haywards Heath. An added bonus for the visitor is the famous steam-operated Bluebell Railway, virtually next-door. Anyone touring southern England would do well to include both the museum and the railway in their itinerary. The address of the museum is The Old Brewery, 53 High Street, Lindfield, West Sussex, RH16 2HN. Telephone (0444) 484 552.

Hope this is of some interest, and don't forget the camera!

**ar**

# Club Contest

## BOOST YOUR CLUB FUNDS

*Help your club and give added strength to the WIA to protect Amateur Frequencies from Government and Commercial Attack*

## HOW?

Simple! Sign up a new member between 1st October and 31st December 1990 and the WIA will pay your radio club a recruitment fee of $5.00.

In addition , the club which signs up the most new members wins a free three year membership of the WIA PLUS three great amateur radio books for the club library.

Every radio club is a winner in this competition! The WIA is a winner! The amateur radio service in Australia is a winner!

**WHO CAN ENTER THIS CONTEST?** Every radio club in Australia which holds an amateur callsign, whether the club is affiliated with the WIA or not.

**WHO QUALIFIES TO BE A NEW WIA MEMBER?** Any person in Australia who has not been a member during the immediately prior 12 months.

**HOW DO YOU SIGN UP A NEW WIA MEMBER?** If your club does not have a supply of WIA membership application forms, then use the form printed on the back of every Amateur Radio magazine fly sheet - even photocopies of that form will suffice.

**WHERE DO YOU SEND THE NEW WIA MEMBER APPLICATION?** Send the application, together with the full membership fee as shown on page 3 of Amateur Radio magazine, to your local WIA Division.

**HOW DOES YOU CLUB CLAIM ITS FEE?** The club secretary writes, on club letterhead, to "WIA Club Contest, PO Box 300, Caulfield South, 3162" with details of the new WIA member. At the end of each month of the contest a cheque for the total amount of all $5.00 recruitment fees due to the radio club will be forwarded.

The club which wins the grand prize of a free three year membership of the WIA, plus books for the club library, for signing up the most new WIA members, will be announced in February 1991.

**Get to work now in this great fund raising contest where everybody is a winner!**


# "The Outbacker"

- ALL BANDS IN ONE NEAT ANTENNA
- CONVENIENT MOBILING
- RUGGED CONSTRUCTION
- COMPLETELY WEATHERPROOF
- SAME COMMERCIAL DESIGN PROVEN IN THE OUTBACK FOR 15 YEARS.

The antenna is constructed of fibreglass with copper helical windings. The exterior is covered with a coating of epoxy and urethane for added strength, durability and protection. Tap points or frequencies are clearly engraved for each band. Sockets are made from brass, nickel-plated.

The wander lead is used for quick, easy, manual band changing – just plug one end into the lowest socket, wind the remainder clockwise around the antenna and plug the other end into the required frequency. Fine tuning for any resonant frequency within each band is made via the adjusting spike at the top of the antenna.

The optional mounting base and spring is made of sold brass, nickel-plated and the spring is zinc-plated spring steel.

An SO-239 is mounted on the side for feed termination. At the bottom of the base a threaded 1/2" hole is used for mounting to the vehicle, via a suitable adaptor (not supplied).

All Outbacker antennas are capable of handling 300 Watts PEP.

**OUTBACKER CODE:**

A 160-80-40-30-20-17-15-12-10 Metre ...$300.00
B 80L-80M-80U-40-20-15-10 Metre.....$266.40
C 80-40-20-15-11-10 Metre .....$255.00
D 80-40-20-15-10 Metre .....$247.00
E 160-80-40 Metre .....$214.00
F 80-40-20 Metre .....$193.00

G 20-15-10 Metre.....$175.00

Extra Frequencies Commercial – RFDS Etc .....$27.00
2-Piece Split Model Available with all codes except codes "A".....an extra .....$40.00
Mounting base and spring to suit all above antenna.....Complete .....$87.00
AIR deliver door to door anywhere in Australia .....$12.00

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# ATLAS 210/215 KEYING MODIFICATIONS

ALLEN CREWTHER VK3SM
28 REYNOLDS PARADE
PASCOE VALE SOUTH 3044

SOME TIME AGO I obtained an Atlas 210 transceiver and, a while later, decided to use it for CW. Having to operate the rotary switch every change-over got on my goat, so I installed the Atlas suggested modification using an external toggle switch.

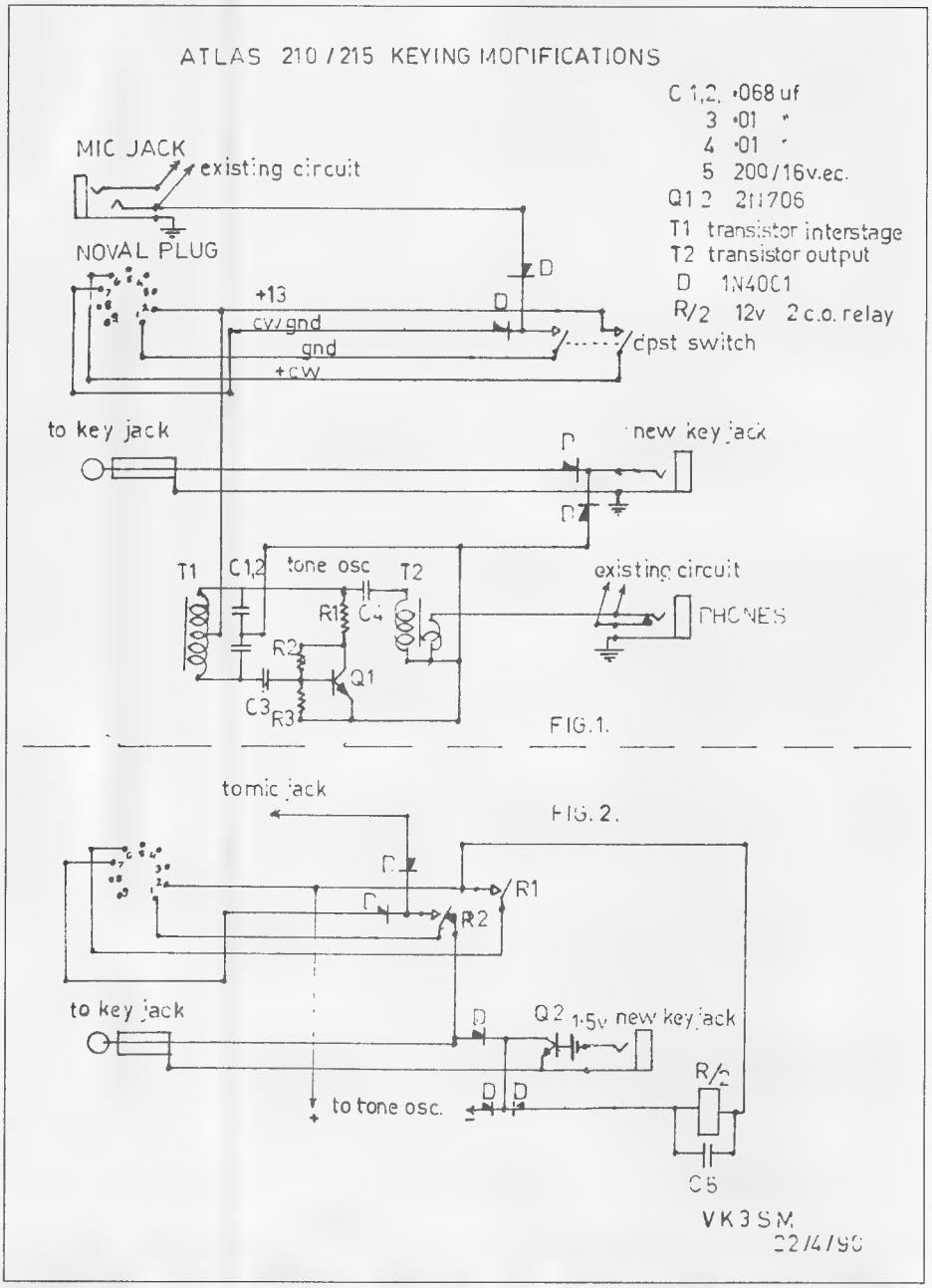
The problem then was that there is no side-tone oscillator provided, and modification (fig 1) resulted.

All was well until I built a keyer, and of course it required a negative key line to operate, and the Atlas had a positive one. A polarity changer was tried and, at the same time, I looked at a means of going from CW to Phone without having to remove the key plug from the back of the set.

The resultant circuit is shown in fig 2, and also results in semi-break-in CW with instant change-over to Phone. The relay used was a Siemens cradle 12V coil 6000 Ohm, and a 200µF capacitor gave me a nice hang time even at 5wpm, although it may be a bit long at 20wpm, but it is easy to adjust — the larger the value the longer the time.

All the circuitry is built in the bottom of the AC console, and now the only connection at the back is the antenna.

If you cannot get a noval plug to fit the socket on the rear of the set, one can be made by cutting the base of a nine-pin valve. Wind one turn of 22G on the tube about 6mm up from the bottom and connect to a Scope iron transformer or 6V winding of an old TV transformer. Make sure the turn is not shorting, and turn on the power. The turn should get hot. Plunge the tube into cold water; the base should snap off, the works can be cut clear and, with some care, wires soldered on the pins. Care is needed as the glass edge may be quite sharp. The wires and base are filled with "Plastibond" or similar, and there is your noval plug.




Tell the advertiser you saw it in the WIA Amateur Radio Magazine

# SIX-METRE REPEATER VK3RMS

IAN WOODMAN VK3ZBI
24 FEWSTER ROAD
HAMPTON 3188

THE MELBOURNE six-metre repeater VK3RMS, sponsored by the WIA Victorian Division, operates from the top of the Dandenong Ranges located approximately 35km east of the city of Melbourne. The repeater is being used to relay the Victorian Division broadcast held on Sunday mornings; it will also provide WICEN with additional facilities should they be required in an emergency. Interstate and overseas amateurs will find this new repeater useful in determining propagation conditions into the Melbourne area.

The motivation behind the erection of VK3RMS is to provide extended mobile to mobile communication and to increase the occupancy of the six-metre band and thereby relieve some of the pressure from the local two-metre repeaters in Melbourne.

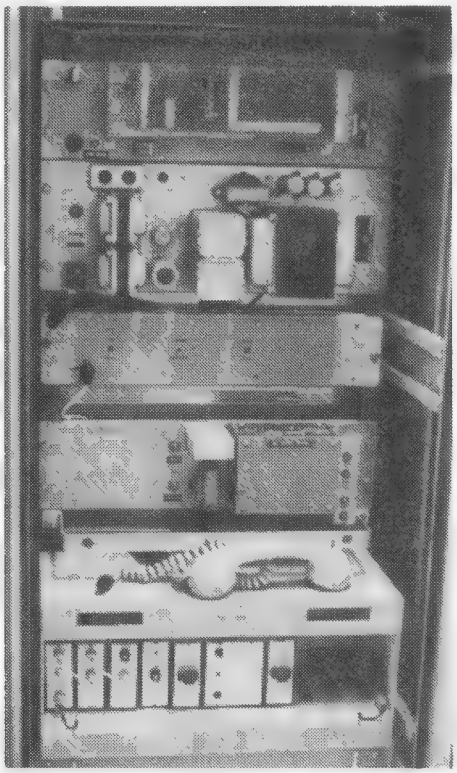
The system was developed in three stages; experiments were carried out using low-power UHF signals into high-gain antenna systems to test the remote receiver to transmitter links to be used. These tests were conducted across the southern suburbs of Melbourne.

The transmitter was then installed on the Dandenongs with the receiver in the southern suburbs using a UHF link to relay the signal between the two pieces of six-metre equipment. After testing, the receiver was also installed on the mountains, but remote from the transmitter site.

The system operates in the following manner:

The input signal on 52.900MHz arrived at the receiving site 561m above sea level, and is fed to a Pye Overland FM receiver via low-loss coaxial cable from a half-wave vertical dipole mounted 24m up the mast. The audio from the six-metre received signal is used to modulate a Philips UHF transmitter operating on low-power FM. About a milliwatt is fed into a six-element Yagi, which fires the signal four kilometres to another six-element Yagi at the transmitter site 550m above sea level. The UHF link signal is demodulated, and the resultant audio modulates an STC transmitter to an output power of 50W on the output frequency of 53.900MHz.

The transmitter antenna is a half-wave vertical dipole mounted 24m up the mast; it is the same type of antenna as used at the receiving site. This antenna was described in 'AR' May 1986. The reason for separating the receiver and transmitter was to reduce desensitisation of the receiver, without having to incur the high cost of the large cavities required for six metres and the tuning of stubs etc. The receiver site was chosen to keep the receiver on six metres as far as possible from the five commercial TV and FM transmitters located on the mountain. At this location there are about 30 two-way radio services within half a kilometre of the receiver antenna; as a result it has been necessary to add extensive selective filter networks to the receiver input.



*Rack Mounted VK3RMS transmitter UHF receiver*

The total system relies on 240V power without any back-up system; therefore, if the power fails, the whole system goes down until the power is restored. The system has the provision for remote shutdown if required, remote back-up reception, remote receiver sensitivity tests and output power measurement.

Field tests done so far indicate that mobile stations using 25 watts can access the repeater 80km south of the receiver site. In the Melbourne suburbs, access has been gained using only half a watt and a roof-mounted antenna — two watts provides noise-free signals. A member of the installation group will be on hand to obtain signal reports after the WIA Sunday broadcasts. In the future, an RF pre-amp is to be added, along with a solid-state final to replace the valve final at the transmitter site.

All projects have their funny moments. Our installation crew arrived at the transmitter site and were admiring the white cockatoos sitting amongst the antennas. They were observed pecking away at something which turned out to be the plastic sheathing on the coaxial cables at the top of the mast! (Hope they weren't ours). It will be interesting to see how long it will be before the rainwater travels down the cable and into the shack. On the day the crew installed the transmitter antenna, a column of smoke was observed rising from the trees west of the nearby town of Olinda. The Olinda alarm sounded. The fire-truck siren could be heard wailing as it headed towards the smoke. The crew up the mast worked on the clamps faster as the smoke increased. The flashing lights of the fire truck could be seen through the trees below. The Mt Dandenong fire truck came wailing through the town headed for the fire. Meanwhile, the guys 25m up the mast were considering how quickly they could get out of the safety harness and climb down. We all remember Ash Wednesday in the Dandenong Ranges. More sirens and flashing lights; things were getting exciting. The Ferntree Gully fire unit arrived followed by more units, clamps tightened, coaxial cable connectors joined and sealed, smoke getting less now. By the time the tools were lowered to the ground the smoke appeared to have stopped and all the fire units returned to their respective bases — enough excitement for one day. Remember, the repeater's primary function is to provide communications for mobile stations. They often become occupied during the DX season, so why not try the international simplex frequency of 52.525MHz?

*Continued on page 14*

# THE IMPORTANCE OF LOW-INDUCTANCE CONNECTIONS OR THE NATURE OF RF FLOW

FELIX SCERRI VK4FUQ
6 GARBUTT ST
INGHAM 4850

I HAVE BEEN PROMPTED to write relating my experiences of the strange things RF energy does when flowing on wires. This discussion will be entirely non-mathematical. In my opinion, the whole problem stems from a generally very poor understanding of the nature of RF energy. It seems to me that most amateurs I have spoken to tend to treat RF as if it was DC flow.

In DC circuits the only constants of importance are voltage, current and resistance (except during transient conditions). In the case of RF flow (being AC) other things become more important. These things are reactive components (capacitive or inductive). Stray reactive components can cause insidious effects, and a proper understanding of the effects may be helpful.

Recently, on air, a conversation between two amateurs was heard, discussion baluns, and one party remarked that he threw out his balun because it tested short circuit with an ohmmeter. Obviously in some need of enlightenment!

In an analysis of RF flow, one will come up with expressions such as "skin effect", which basically means RF tends to flow on the outside of the conductor, due to self-inductance. Even a straight piece of wire exhibits appreciable inductance. Remember, inductance gives rise to reactance, and that gives rise to phase shifts and other strange effects. What does all this mean?

Some time ago, I upgraded to an IC-735, and decided to add a high-quality microphone and pre-amp combination. This was done successfully. However, I began to receive reports of bad audio symptomatic of severe RF feedback. A mad search to find the cause ensued, and just about everything in sight was either bypassed or filtered, with no success. Eventually the cause was found to be one of those "insidious effects" I spoke of earlier. A word about my antenna system is now probably in order. I use open-wire feeder to all antennas with 4:1 baluns at the station end feeding a home-made ATU to give 50 ohm unbalanced output.

The ATU was built in the good old-fashioned way, on a wooden baseboard, with all "earth" points on the ATU connected with heavy green "earth wire". Having once read of "stray" inductance in leads, I, by now clutching at straws, replaced the wire with lengths of RG213 braid (a known low-inductance conductor) and, in one fell-swoop, all problems disappeared.

After some head-scratching it was finally realised what had happened. In any coaxial (ie unbalanced) type of circuits you have two conductors, one at a given RF potential and the other at a neutral or ground point, or so it should be. In any RF circuit, a stable groundplane or RF earth is absolutely vital. A rough, but accurate analogy is, for example, building a structure on unstable ground (eg earthquake-prone). Nothing is going to be stable, is it?

In my own case, what was happening was that the inductance present in the green earth wire provided "built-in reactance" into what should have been an ideally non-reactive reference. Initially I, for one, was quite sceptical, but tests conducted later proved this analysis. Since this incident I have seen these effects manifest in many other instances. I have seen it in two-metre yagis, mobile installations, and even commercially made gear. It isn't anything like DC is it?

In summary, the importance of low-reactance connections cannot be overstated and, especially critical for RF earths and groundplanes, ordinary wire is a definite no-no. Braid from RG-213 or similar coax or wide strips of flashing copper is ideal for low-inductance connections

So, there you are. If you have — or suspect — a similar RF problem, examine your set-up for the possibility of reactive connections on earths; you might end up with a vastly improved amateur station. **ar**

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*Six Metre Repeater VK3RMS Continued from page 13*

**System Specifications:**

| | |
|---|---|
| Reception frequency | 52.900 MHz |
| Receiver sensitivity | .20 mV for 20 dB signal to noise |
| UHF link deviation | ± 5 kHz |
| Transmitter frequency | 53.900 MHz |
| Transmitter RF power | 50 watts |
| System time out | 4 minutes |
| Repeater offset spacing | 1 MHz |
| System polarisation | Vertical — six metres |
| Link polarisation | Horizontal — UHF |
| Identification VK3RMS | Tone/Morse Code |
| Transmitter tail | 1.5 seconds |

**Victorian Six-Metre Repeaters**

| Callsign | Tx Frequency | Location | Distance from Melbourne |
|---|---|---|---|
| VK3RMH | 53.550 MHz | Wattle Glen | 35km north-east |
| VK3RDD | 53.575 MHz | Dandenong | 30km south-east |
| VK3RTN | 53.675 MHz | Lake Mountain | 100km north-east |
| VK3RMS | 53.900 MHz | Mt Dandenong | 35km east |
| VK3RGM | 53.975 MHz | Mt Buller | 155km north-east |

The installation group Ian VK3AYK, Len VK3AQJ and Ian VK3ZBI wish to thank Peter VK3ZPP, Steve VK3BYI and Les VK3SL for their help with the repeater project. **ar**

# A 28-VOLT POWER SUPPLY FOR USE WITH AN HF LINEAR AMPLIFIER

BRIAN JONES VK2BRD
15 JOHN T BELL DRIVE
WALLSEND 2287

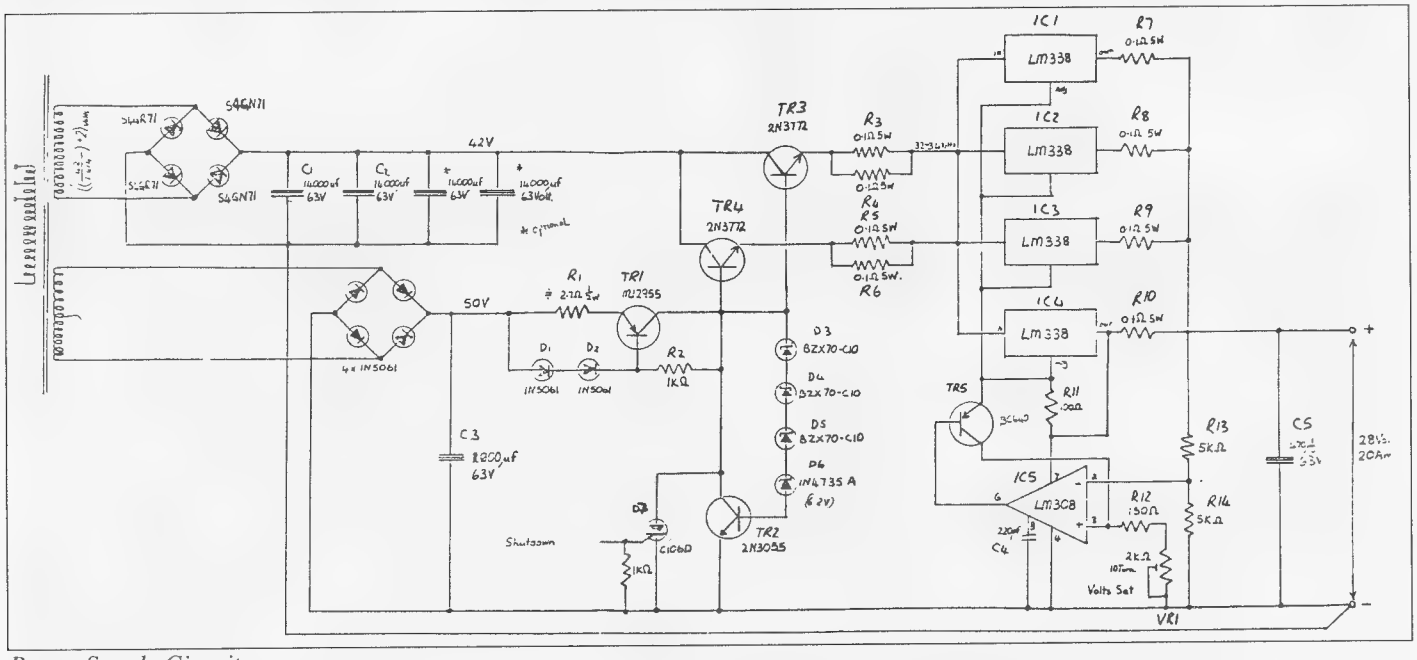
THIS REGULATED POWER supply is designed to give good regulation over a wide range of load currents such as powering a 300W PEP output SSB linear amplifier and surviving accidental overloads. Good regulation is essential to prevent distortion in such an amplifier. Other factors taken into account in this design are controlled dissipation by all components to reduce the energy wasted at both low and high load currents. Component types used were chosen for their characteristics and reliability.

This power supply can be broken up into logical blocks: power transformer, rectifier and filter capacitors.

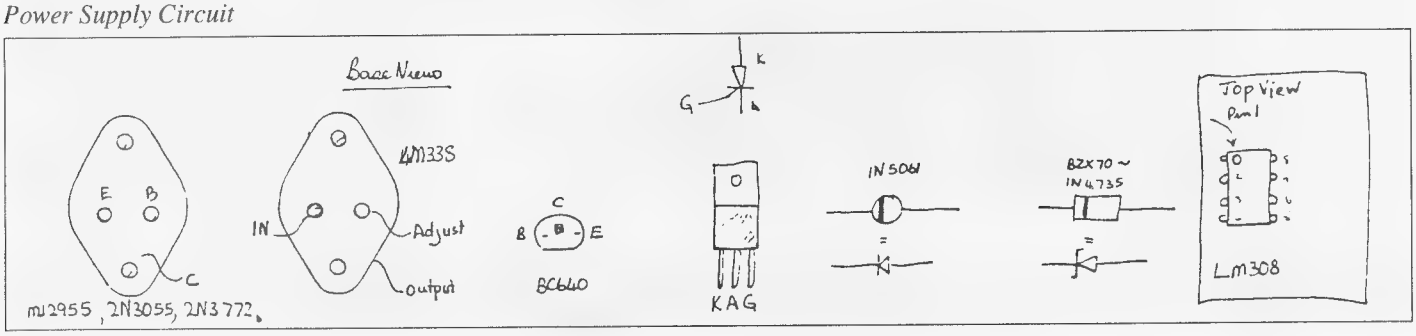
The power transformer should be rated at about 1kW. The secondary voltage of the main winding should be (42/1.414 + 2) = 32 volts RMS. The auxiliary supply is derived from a 37V winding (this can be a separate transformer).

The main rectifier is a bridge configuration consisting of stud mount diodes (400V PIV 40 amp) mounted on two 76mm lengths of Philips 35D heatsink. The diodes should be complementary pairs mounting the normal pair on one heatsink and the reverse pair on the other. The heatsinks must be mounted vertically, insulated from one another and earth on, say, Dick Smith insulated spacers (H-1842) and mounted inside the power supply case. One heatsink is the positive rectifier output and the other is negative. You may think this is excessive heatsinking, but 20 watts is being dissipated on each heatsink at full load current. Bridge rectifier assemblies such as the four-terminal PB40 are unsuitable, as they can't dissipate the power efficiently and usually fail. Current flowing from the rectifier is I load + I filter capacitors.

The main filter capacitors used are low ESR types with high ripple current rating. By using capacitors with low equivalent series resistance, the voltage change across the capacitors is minimised between light load and full load. This reduces the power dissipated by the series pass devices. The type used was Philips 222 106 38153.




*Power Supply Circuit*




*Semi-conductor connections*

Wiring technique and component placement are important around this area. A minimum of 4sq mm hook-up wire should be used, and wire lengths should be kept as short as practicable. Capacitors should be mounted near the rectifier but not so close as to heat them from the power dissipated in the rectifier. Wiring should go from the transformer to the rectifier, from the rectifier to the filter capacitors and then from the filter capacitors to the regulator components.

Incorrect wiring technique will result in the equivalent of higher ESR which defeats our object.

The auxiliary winding voltage is rectified by a bridge rectifier and filtered by a capacitor. The drain on this auxiliary supply is approximately 100mA continuous.

## Series Pass Pre-Regulator

This pre-regulator has its output voltage set by a zener diode network connected to the series pass transistors. This "zener diode" consists of D3, D4, D5, D6 and TR2 connected as a power zener. Power dissipated by this "zener" occurs when power output current is minimum. The current source consists of R1, R2, D1, D2 and TR1. The voltage drop across R1 is held constant by the voltage across D1 and D2 and the beta of TR1 thus forming a current source. TR1 and TR2 are mounted on a 76mm length of Philips 35D heatsink, but insulated from it. The series pass transistors TR3 and TR4 are high gain at high-current, high-voltage transistors. Using these transistors reduces the base current required to allow high collector currents to pass. Load current sharing between TR3 and TR4 is achieved by using R3, R4, R5 and R6. The output regulation of this pre-regulator is about two volts. Heatsinking of TR3 and TR4 is discussed later.

## Series Pass Regulator

Final output voltage comes from four LM338 IC adjustable voltage regulators connected in parallel. The output of each regulator has a current sharing resistor which forces even sharing of the load current. The disadvantage of these resistors is that the voltage drop across them ruins output regulation. This is overcome by using an LM308 Op Amp (IC5) to monitor the output voltage and feed a modified control voltage to the adjustable voltage regulator's "adjust" pin via transistor TR5. Output current is limited by the input to output voltage differential across the regulators. Two 200mm lengths of Philips 55D heatsink are used to mount all the series elements. TR3, ICI and IC2 on one piece and TR4, IC3 and IC4 on the other. These heatsinks must be mounted vertically on the outside of the power supply case.

## General Construction Requirements

All TO3 devices mounted on heatsinks need to be insulated from them using high-quality mica insulator washers with copious quantities of thermal paste applied.

Power diode mounting requires only thermal paste since these are mounted on insulated standoffs. All TO3 devices should have TO3 transistor insulator caps fitted to remove any voltage hazards. All components in the high current areas are mounted on the back of associated heatsink using tag-strip terminations. The negative output lead is connected to the negative output terminal directly from the filter capacitors. The positive lead is connected to the positive output terminal and R7, R8, R9 and R10 by short as possible lengths of 4sq mm wire. R13 is connected to the positive output terminal. C5 is connected across the output terminals. For all other writing use 0.5sq mm insulated wire. **ar**

# MORSE RECOLLECTIONS

S Wright VK6YN (ex G3CYT, ZE1BY, ZE5JH, ZS5BG, VQ2SW)
19 John St Gooseberry Hill 6076

I READ WITH MUCH interest the article by VK5BR on the early background of telegraph codes, published in the September 1989 issue.

It brought back many memories of life in Zimbabwe (then Rhodesia) in the immediate post-war years, when I was with the national railway as a station master at various remote bush stations.

The railway operated narrow-gauge line (3'6") single track, with manned stations every 50 miles or so, with several intermediate sidings between, where the train crews themselves effected what was called a 'crossing'. The method of control of the trains was the issue of our 'Authority to Proceed' by the station master, which instructed the crews to 'cross' various opposing trains at the intermediate sidings, and obviously the orders for all opposing trains had to 'match', otherwise it was possible for two opposing trains to meet each other at a point between any two intermediate sidings, with most unfortunate consequences.

The station master arranged the 'Authority to Proceed' by the use of the "Morse Telegraph Instrument", and the whole of the 'authorities' were transmitted along landlines between the stations using the standard Morse code.

A record of the exchange of the messages was achieved by the use of an INKING machine, which recorded the dots and dashes from the sending station on a narrow paper tape which was driven by a clockwork mechanism.

It was possible to read the incoming message (embodying the names of the intermediate sidings while the trains were instructed to 'cross') by the clicks of the telegraph relay, but this was strictly forbidden. The proper procedure was to examine the paper tape with its recorded dots and dashes, and if the crossing places for the opposing trains were the same, the 'authorities' could then be prepared and issued to the train crews.

The names of the 'intermediate' sidings were quite distinctive; many were derived from the traditional African name for that particular place, whereas others had names given by European settlers to perhaps remind them of their earlier days in other countries.

Some of the local names for the sidings were quite colourful and rhythmic, such as Chikonkomene, Muzungushi Sambawizi, but by some remarkable instance of juxtaposition — hardly anticipated by Mr Morse — two adjacent sidings in one section between two manned stations were EAGLES NEST and UMFESERI. Completely different, you would say, with little or no possibility of mistaking one for the other with, perhaps, disastrous consequences in the preparation of the 'authorities to proceed' resulting in two opposing trains meeting head-on between the two sidings.

Well, having regard to the fact that the spacing of the dots and dashes on the paper tape was not always to the required standard, if you will write down the dots and dashes for the one siding and, immediately below, the dots and dashes for the other siding, you will see that the station masters in control of the section containing those two particular sidings were obliged to exercise more than usual vigilance in the preparation of 'authorities to proceed'.

Rapid development of signalling and train control soon overtook the basic "Telegraph Order System" and, with the implementation of "Centralised Train Control", the railways of Zambia and Zimbabwe were second to none in safety and efficiency.

**ar**

# Radio Amateurs: Have you checked out EA lately?

No doubt most radio amateurs are aware that *Electronics Australia* is by far this country's largest-selling electronics magazine, as well as being its oldest (we began way back in 1922, as *Wireless Weekly*). But have you looked inside the magazine lately?

Now it's bigger and better than ever, because our leading competitor *ETI* has been merged with us, to form *Electronics Australia with ETI* – the biggest, brightest and most informative electronics magazine, bar none.

You'll now find lots of new 'departments' in the magazine, including Solid State Update (with news of new semiconductor devices), Silicon Valley Update (news from the USA) and What's New in Entertainment Electronics. Plus all of your old favourites like Forum, The Serviceman, Circuit and Design Ideas and so on. And of course plenty of 'meaty' technical articles and contruction projects.

**INCLUDED IN OUR DECEMBER ISSUE:**

**IMPROVING ICOM'S BP-70 BATTERY PACK**

Ever wished that you could transmit with your Icom hand-held, as the battery pack is being recharged? Lew Whitbourn, VK2ZIP shows you how it can be done, with a simple mod to the BP-70 battery pack (and others too).

**RF Z-BRIDGE, DUMMY LOADS FOR UHF**

In the final article describing his revamped VHF Powermatch, Jim Rowe VK2ZLO presents a new Impedance Bridge that operates right up to 1296MHz, plus a pair of low-power 50 ohm dummy loads.

**REVIEW OF AT&M'S RADIO MODEM KIT**

AT&M has a pair of kit modules that go together to make a V23 data modem for use with transceivers. Here's what we found when we built up a couple and tried them out.

What about *amateur radio* projects? Well, as you can see there are more of these than before – but we're very interested in publishing more. So if YOU have developed an exciting amateur radio project, contact Jim Rowe by writing to him at EA, 180 Bourke Road, Alexandria 2015. Or phone him on (02) 693 6620, to discuss the possibility of publishing it as a contributed article. As well as earning a fee, you'll also be helping to boost interest in amateur radio!

**Take a look at the new, bigger and brighter *Electronics Australia with ETI* – on sale at your newsagent at the beginning of each month. Or subscribe now, by phoning (02) 693 9517 or 693 9515.**

Electronics Australia WITH ETI

**Australia's Top Selling Electronics Magazine**

# COMPUTERS AND REMEMBRANCE DAY CONTEST 1990

ARN WIERENGA VK7KR
79 GRONINGEN RD
KINGSTON 7050

WITH TECHNOLOGY FORCING its way into the ham shack, computer-aided contesting appeared to be the order of the day.

Being a firm believer that the computer is the slave, the human is the master, I endeavoured to create a system to make the tasks of logging, duplicate checking, coffee brewing and CW sending a little easier than by using the traditional methods. After much trial and error I think I achieved some of these aims.

My last attempt in the contest some two years ago produced satisfying results aided by a personal contest logging program long since out of vogue. It was written over several contest weekends and developed into quite a program, but was severely limited due to being written in Basic and for a CPM machine with chronic memory problems. With my XT-compatible now proudly occupying the space of the old portable, I suffered a lack of enthusiasm at the idea of translating the old faithful logger into a form the PC would understand. Instead, a good database program, although not capable of doing some of the old fancy things, was able to supply the goods.

After some easy definitions and some more complex report formatting, the new contest logger was set to go. All I had to do for each contact was enter the callsign and number received, because the date, time, number sent, band and points were all generated by the machine automatically. The biggest limitation with the system was a lack of real time duplicate checking. Maybe that old Basic program is not yet redundant! To compensate for this, the PC generated a neat little printed sheet for manual duplicate checking. Naturally the slave confirmed a lack of duplicates after the event.

As the contest was drawing near, I realised that the computer could also be used to automatically send my CW CQ calls. The junk box was raided and a makeshift interface was furiously constructed between the serial port and the Yaesu. The Morse program used to drive the radio ran like a dream and all was in readiness. T – 60 and disaster struck. A lack of multi-tasking meant that I had to make an unforeseen choice: a contest log or auto CQ calls. The dilemma was almost too great to resolve until I managed to procure a friend's portable machine 10 minutes before the contest. Having missed most of the broadcast by now, I brewed a coffee and set to the task of manipulating the appropriate files and connecting the hardware for my new CQ caller. At T+10, after much despair, the portable machine was stored away in a dark corner. The serial port connector was the opposite polarity of mine and I did not readily possess the resources to rectify the problem.

Manual CW keying is fine. I actually enjoy it. My wrist was in need of some good sending practice in any case. After some 12 months of stagnation on the key it took all of the evening to get some rhythm back into my sending. With RSI threatening, no new calls on the band and droopy eyelids, I called it a night not long after midnight.

Much too early for a Sunday, I arose with the birds, keen to score well this year, my first all-CW RD contest. As luck would have it, the same calls I gave up on last night were still the only ones around. Amid expletives and exasperation I wondered what I could do in the meantime. Less than one hour later, stretching the resources, I was able to welcome the late risers with my auto CQ calls. Ahhh bliss! What a difference this made. The pace prior to this was frantic, but now I could remain calling while stretching, reading a magazine, talking to friends who visited, and even tidy up the log. With the addition of a small FM transmitter I could make breakfast and coffee, and complete the essentials all without breaking the calling process. I even had the ability to answer the moment a call was received.

The contest became so relaxing that, given sufficient space on the desk, I could have called on a third computer to begin the word-processing involved in this article. What a shame I have more multi-tasking ability than my humble PC, although with a 486 machine running at 25MHz, and 'windows' thrown in . . . Oh well, I can always dream on. It was fun to have computers do some of the repetitious tasks of amateur radio contesting. It was fun to answer stations with the hand key still rather than have the machine take over the station. It was fun to score well this year and enjoy being competitive.

See you on the CW end of the bands next year. If you hear VK7KR, imagine with a smile a wall of computers with the one-time master frantically trying to tame them. Please forgive him if he seems a little vague, as though his attention is elsewhere. **ar**

# TALKING-BOOK REGULATIONS

The Department of Transport & Communications regulations brochures for the Amateur Service in Australia, DOC 70, 71 and 72, are now available on audio cassette for use by the visually impaired.

The Royal Blind Society of NSW has produced a talking-book version of these brochures which form the study syllabus for the Amateur Regulations Examination. Knowledge of the current regulations are also needed by radio amateurs so they can comply with the conditions of their station licence. Enquiries should be directed to the Society at 4 Mitchell St, Enfield NSW 2136, or by telephone on (02) 747 6622.

**ar**

# THE FILTER THAT WAS NOT

DAVID G BARNEVELD VK4BGB
PO BOX 275 BOOVAL 4304

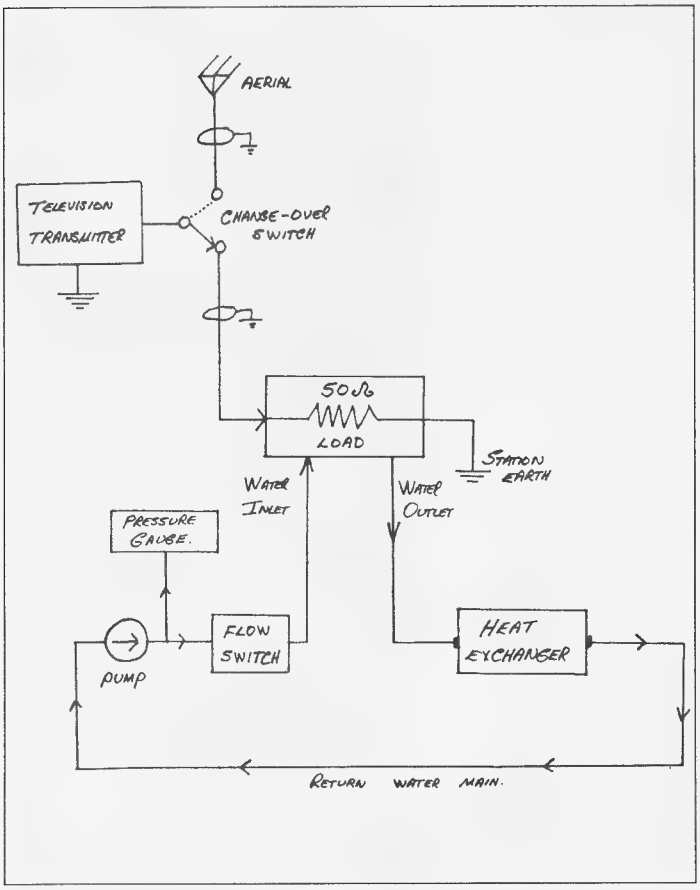
THIS ARTICLE HAS NOTHING to do with low pass filters nor, for that matter, high pass filters. To be truthful, it is about a water filter. Now, before anyone conjures up visions of yours truly in his shack with water-cooled anodes, multi-stage turbine water-circulating pumps and oodles of kilowatts emanating from a linear as big as a garden shed, let me explain this strangely titled story in more detail.

The incident that I am about to reflect upon concerns a commercial water-cooled RF dummy load. This load, rated at a continuous 25kW of thermal dissipation, is used to terminate the television transmitters at Channel 7 in Brisbane during periods of maintenance. The unit itself consists of a terminating resistor (50 ohms), a water pump and a forced air cooled heat exchanger (see diagram).

Under normal operation, the pump outlet discharge pressure into the load resistor housing runs at approximately 25psig. It had been noticed, however, that the pressure gauge had been registering a slow upward movement in pressure over a period of time. In fact, it had now risen to roughly 55psig. As the layout of this system is relatively simple, and being a closed coolant loop, it was hard to imagine a blockage forming anywhere due to contaminants entering the system.

A thorough investigation was called for, however, when maintenance records indicated a similar problem with an identical dummy load connected to the 20kW FM radio transmitters located in the same building.

Next day, armed with shifting spanners and an assortment of tools, work commenced on removing the faulty dummy load assembly from the three-inch rigid coaxial cable that fed the output of the transmitters into it, and then to dismantle it completely. As stated earlier, the entire unit is fully self-contained, therefore we were unsure as to what could be causing the unduly high pump-back pressure.




*Basic Dummy Load Layout*

After the inspection covers were removed, the entire assembly was stripped down bit by bit and checked for blockages. However, none was found. At this point in time you will probably be suspecting that the pressure gauge itself is faulty, and this had occurred to us also; but why the same problem on two identical dummy load cells?

Further investigation was called for. This time the entire pump assembly was stripped down, but apart from minor pitting associated with the turbine blading on the impeller shaft, nothing was found to be unduly amiss. A recheck of the operations manual assured us that no filters were in the lines, so what on earth could it be?

The only thing left that we had not attempted was the load cell housing which contained the main resistor. The associated cooling fins and pipework had been flushed, with not a trace of residue of any description whatsoever being found.

No, the load housing would not be at fault. After all, it contains only the resistor and nothing else. Even the handbook tells us that! Guess again, folks! After the 20th bolt was removed and the unit disassembled, it was found that the inside of the return water passage contained a small brass micromesh filter screen some 30mm in diameter. This screen was approximately 85 per cent blocked by a heavy, rock hard, calcium-like coating. Here was the answer to our high water pressure problem. This also explained why the increase in pressure was on a gradual incline. As the filter became progressively more clogged with this foreign material, the water pressure would start to increase downstream of the pump discharge port. This was as indicated by the pressure gauge. The cause of the blockage has as yet still to be determined; however, it appears from a closer study that the culprit may very well have been electrolysis between the copper and the brass in the system, accelerated by the RF electrical energy within the housing. This finding is not conclusive at the present time. The interesting point worth noting here, however, is that nowhere in the operations manual did it make mention of this filter. Had we been aware of its existence in the first place, this would have been our first port of call, and undoubtedly saved many hours of wasted trouble-shooting. It's easy to get caught, isn't it? 73 **ar**

## Stolen Equipment

Stolen from Holden VN Commodore parked at Golden Sands Reception Blackburn Rd East Burwood November 1st 2 ICOM IC290A serial No 001532 All mode transceiver contact Geoff Atkinson VK3YFA or your local Police Station.

# TESTS ON THE COMPACT COIL Z MATCH

LLOYD BUTLER VK5BR
18 OTTAWA AVE
PANORAMA 5041

## Introduction

IN "RANDOM RADIATORS", a feature of 'AR' March 1990, Ron Cook VK3AFW and Ron Fisher VK3OM described a version of the Z match tuner which used smaller-dimension coils than others documented elsewhere for this type of tuner. The Z match tuner has had the reputation of being able to match a wide range of antenna circuit impedances and the question was raised whether, in using these smaller coils, this range has been restricted or otherwise affected. This question has been the subject of my many discussions with Ron Fisher on 80 metres of a Sunday night.

I recently found that I had a need for a small but versatile tuner for field use and decided it was the time to join the Z match user's club and build a Z match unit for myself. The unit was assembled with coils made to the precise specification given by the two Rons and hence I was in a position to test this unit and assess its performance. I had previously carried out tests on a Z match unit built by Dean Probert VK5LB to a specification published in the RSGB handbook. The objective of the previous examination was to find some explanation for how the "magic box" worked and to evaluate what range of antenna impedance it could match. Some theories on how it operated and a report on its performance were published in 'AR' May 1989. Tests have now been carried out on the compact coil version, and these tests are the subject of this new article. As a reference, detail of the coil forms and the circuit diagram, as published in "Random Radiators" is repeated in figure 1.

## Comparison of Specifications

To provide some idea of the differences in specifications for different version of the Z match unit, table 1 has been prepared listing coil dimensions and inductances and tuning capacitor maximum capacitances. Quite apart from the compact coil version, it turns out that even the RSGB version is a little different from the early Z match by A W King W1CJL, published in QST, May 1955. The "Random Radiators" coils, with smaller diameter windings, have lower inductances but not to a radical extent. The loss of inductance caused by the smaller diameter is partly compensated by increasing the number of turns.

In my May 1989 article, I drew attention to the importance of the coupling coefficient between the primary and secondary of the coils. A coupling coefficient of around 0.65 provided an effect which caused a low value of secondary load resistance to be reflected as a much higher impedance at the primary. This played a large part in extending the range of antenna load resistance which could be matched. A nice thing about coupled coils in air is that the degree of coupling and hence the reflected impedance can be adjusted with minimal loss of power. (This, of course, has always been a method of controlling output coupling in valve RF power amplifiers). Bearing this in mind, I measured the coefficient of coupling of the compact version coils to make further comparison with the RSGB coils. The results were very similar to the RSGB version with L1-L2 = 0.61 and L3-L4 = 0.64.

Another factor which should be recorded is the wire gauge I used on my models of the compact coils. I used enamel wire with a diameter of 1.8mm which is fairly close to 14-gauge B&S. "Random Radiators" specified 18 SWG but I think this must be a documentation error as the wire appeared to be a heavier gauge in the photographs included.

A further factor of comparison is the rang of tuning capacitance used. The maximum value of C1 in the various Z match versions varies from 300pF to 500pF. From my own experience, the precise value is not critical. An important difference is the value of C2. The maximum value specified for the W1CJL and RSGB versions is 2 x 250pF, but this has been increased to 2 x 400pF in the "Random Radiators" version. As we will see further on, the extra capacitance is needed to tune 3.5MHz. In my own constructed unit, a pair of two-gang 200pF variable capacitors were selected. I chose these because they had plate spacing of 0.02 inch, double that of the usual receiver tuning gang. The two halves of one gang in parallel provided 400pF for C1. As it turned out, 2 x 200pF for C2 proved to be inadequate and an extra switch had to be provided to switch in extra capacity and extend the range to above 360pF.

## Matching Range

To check out the matching range, a test procedure was set up similar to that I had used in previous tests. Tests were carried out at 3.5, 7, 14, 21 and 28MHz for incremental load resistances within the range of 30 to 2000 ohms. A receiver, set to the required frequency, was coupled to the output of a noise bridge. The bridge input was first connected to a precision 50 ohm resistance and the bridge arms adjusted for a balance indicated by the noise null. Taking care not to upset the bridge adjustments, the bridge input was transferred to the TX/RX connection of the Z match. The Z match antenna terminals were then connected to a defined load resistance and balance attempted (indicated by the noise null), by adjusting the two Z matching tuning capacitor dials. Assuming balance was obtained, the settings of the dials were logged. This was repeated for all load resistance increments within the range specified and at all frequencies specified. Use was made of both L2 and L4 antenna feed points as discussed in the following paragraph.

General references to the Z match unit have specified that the larger coils be used for 3.5 and 7MHz and the smaller coils for 14 to 28MHz. My previous tests on the VK5LB unit were carried out on that basis and a number of gaps were found in the tunable load range. As pointed out in "Random Radiators", a number of Z match users have observed

that a match is often obtained by using the opposite antenna connection to that defined above. In fact, the procedure adopted by the users is to check both L2 and L4 connections. If one does not match, the other probably will. My tests have verified that by using this procedure, the compact coil Z match unit can match a 50 ohm transmitter output to the tested load range of 30 to 2000 ohms resistance, at all the frequencies selected.

Figures 2 to 6 plot the capacitance of C1 and C2 which were found to give a match over the tested load range. Dial settings have been converted to absolute capacitance by calibration using the tuning capacitor reconnected to a digital capacitance meter. Output A refers to the connection via the larger coils L3-L4 and Output B to the connection via the smaller coils L1-L2.

In figure 2, plotted for 3.5MHz, we see that matching above 100 ohms is achieved using output A. However, below 100 ohms, we run out of capacitance in C1 and output B must be used. If we extrapolate the curves of output B above 100 ohms, it can be seen that some resistance above 100 ohms could be matched using either output. Examining the maximum value of C2 on the curves, we see the reason why a 2x400pF capacitor must be used rather than 3x250pF as specified in the larger coil versions of the Z match.

Figure 3 shows that 7MHz can be matched for all resistances tested using only output A. This is a different result from that obtained from previous tests using the Z match unit with the RSGB specification coils. In that case, the output A circuit appeared to have too much inductance to match over the full resistance range.

Figure 4 shows that at 14MHz all resistances tested were matched using only output B. At around 200 ohms, the capacitance value of C1 rises to near 350pF, more than the specification of 300pF for C1 given in "Random Radiators". If that is the limiting value, it is of no great concern because, in fact, the whole resistance range can also be covered using output A with no greater capacitance in C1 than 75pF.

In using output B for 21 and28MHz (figures 5 and 6), it was found that output B could only be used for resistance values below 200 ohms and output A had to be selected for the higher resistance range. Extrapolating the output A curves indicates that this output could also be used for some values below 200 ohms.

It must be emphasised that the tests were carried out with only a resistive load. In practice, reactance in the antenna system must also be phased out by the tuning of the Z match unit. To assess the ability of unit to also correct for a range of reactance variations, a few additional tests were carried out with reactance in series with a 50 ohm resistive load. The procedure was to connect a reactance of 1000 ohms, as an extreme value, and attempt to match the resultant complex impedance load. If the match could not be achieved, the reactance was then progressively reduced in value until it was found that a match was possible. The tests were carried out for both capacitive and inductive reactance at all the frequencies previously tested with the resistive loads. The results of the tests provided an evaluation of the reactance correction range of the tuner for the condition set up. The evaluation is given in the following table:

3.5MHz — minus 1000 ohms to plus 1000 ohms

7MHz — minus 800 ohms to plus 600 ohms

14MHz — minus 1000 ohms to plus 800 ohms

21MHz — minus 1000 ohms to plus 900 ohms

28MHz — minus 900 ohms to plus 700 ohms

To achieve the match at the extreme reactance values, output A was used at 7MHz, output B at 3.5, 14 and 21MHz and both outputs A & B at 28MHz. Whilst the reactances in series with a 50 ohms resistance represent only a segment of the possible range of complex antenna impedances, the results are sufficient to indicate that the Z match unit can handle quite a range of reactive loads.

## Power Loss

Any coupling device must have some power loss and one might raise a question concerning power efficiency in the Z match tuner. To put the question, what proportion of power is fed to the antenna and what proportion is lost in the matching unit. This, of course, is where the choice of wire gauge used in the coils might have a profound affect. To make an efficiency assessment for a wide range of load conditions would be a difficult task but I did carry out some tests using a 50 ohm load.

The test procedure was as follows: The transmitter was first coupled via an SWR bridge directly into a 50 ohm dummy load and set for continuous carrier. The power into the load was derived by measuring the RF current into the load. The resonant plate current in the power amplifier was carefully noted to record the loaded condition of the transmitter. The transmitter with SWR meter was then reconnected to the load via the Z match unit which, with transmitter on, was adjusted for a null in reflected power as indicated on the SWR meter. The transmitter tuning and loading adjustment was checked to ensure that the loaded plate current was the same as before. The power was again recorded and the reading compared with the previous reading as a measure of power efficiency in the Z

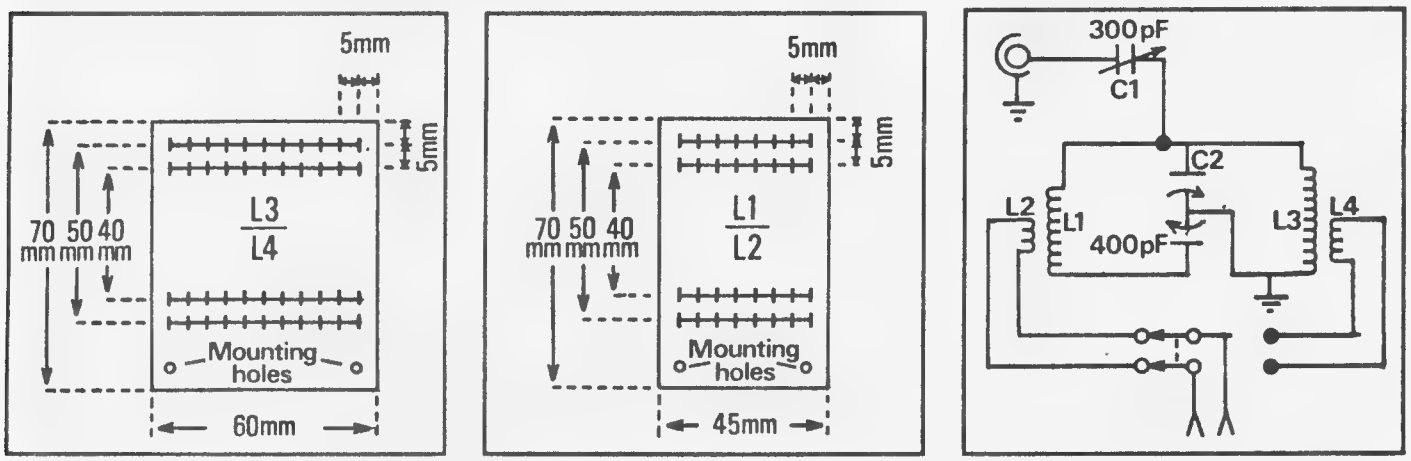



*Figure 1 Compact coil version of the Z match - circuit diagram and coil forming details from "Random Radiators", Amateur Radio March 1990*

match circuit. The tests, as described, were carried out at 3.5, 7, 14, 21 and 28MHz.

At 3.5 and 14MHz, there was little difference in the readings compared and loss of power was assumed to be negligible. At 7MHz the power measurement ratio was 85 per cent, and at 21 and 28MHz it was 80 per cent. The technique used can hardly be described as precision measurement but probably good enough to assess the Z match unit as having an acceptable loss factor, particularly at the lower frequencies. It would be interesting to know just how well other forms of antenna tuner would fare in being subjected to this type of test.

## Features of the Z Match

I am not sure that all the features of the Z match tuner have been documented in 'AR' as completely as they might have been. I think that a summary of these features, at least as I see them, would be in order. Several writers have emphasised the ability of the tuner to match both balanced and unbalanced antenna loads. Other types of tuner are more often of an unbalanced form and to feed a balanced antenna circuit, a balun transformer is required at the tuner output. The usual type of toroidal balun unit is not suitable for high-impedance antenna loads and, for this type of load, the balun unit must be placed at the tuner low-impedance input. Following series reactive elements in the tuner must then be doubled up to retain a balanced circuit. The Z match tuner output coils provide the unbalanced to balanced conversion without these complications.

What seems to me to be another important feature of the Z match unit is that the two variable elements are capacitors which, being continuously variable, allow a precise match to be set. Other matching systems use variable inductors which have their own inherent limitations. Either the inductors must have multiple taps connected to multi-position switches or be of the roller inductor type. The switched taps inductor has the limitation that only incremental steps of inductance can be selected and a precise match is often difficult to achieve. Furthermore, from the construction point of view, quite a spider web of wiring is required between coils and switches. The roller inductor solves the problem of the incremental steps and eliminates the wiring complication but it is often difficult to obtain or expensive to purchase. Apart from that, changing bands can be a nuisance as the inductor often has to be wound many revolutions to achieve the inductance change needed.

The third feature, from the home constructor's point of view, is the simplicity of the Z match unit. Coils have to be assembled, but this is a straightforward task if constructed as recommended. I followed the instructions of first winding the wire on a smaller diameter former, as specified in "Random Radiators" and found that the resultant coil spiralled with ease into the holed formers prepared. The compact coil version of the Z match fitted easily into an aluminium box 180mm x 115mm x 158mm. This allowed considerable space between the coil assemblies and adjacent metal components such as the tuning capacitors and the sides of the box. This spacing is necessary to minimise inductive coupling into the metal components and hence minimise absorption of RF power and loss of coil inductance. The unit, as constructed, did not include an SWR meter as shown in the photographs of the "Random Radiators" sample unit.

The last feature of the Z match unit is that, despite its simplicity, it seems to have the ability to match a wide range of antenna load impedances at frequencies covering most of the HF spectrum. Referring to our own test curves (figures 2 to 6), we have verified that the compact coil version can be matched for a load resistance range of 30 to 2000 ohms at amateur frequencies of 3.5 to 28MHz. This, of

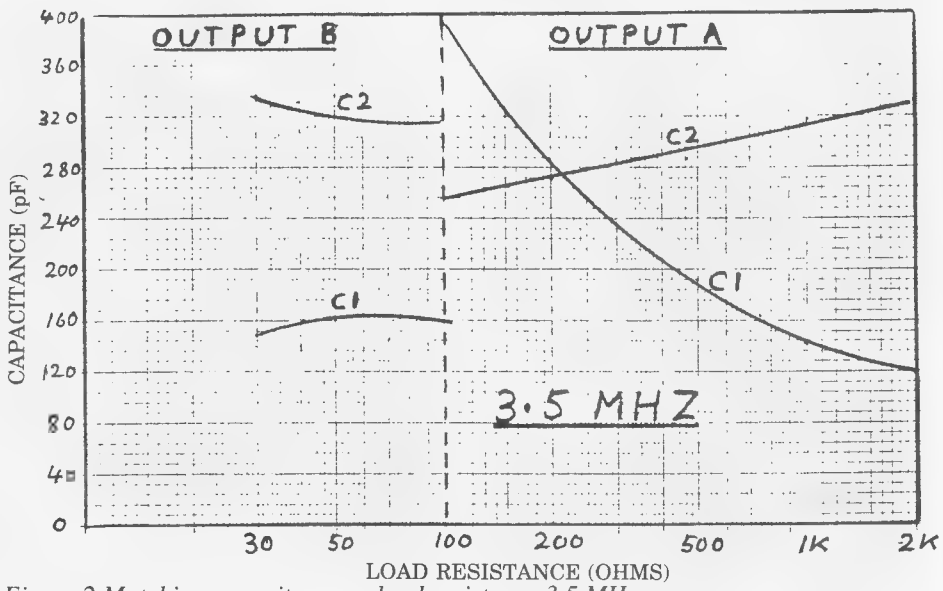



*Figure 2 Matching capacitance vs load resistance 3.5 MHz*

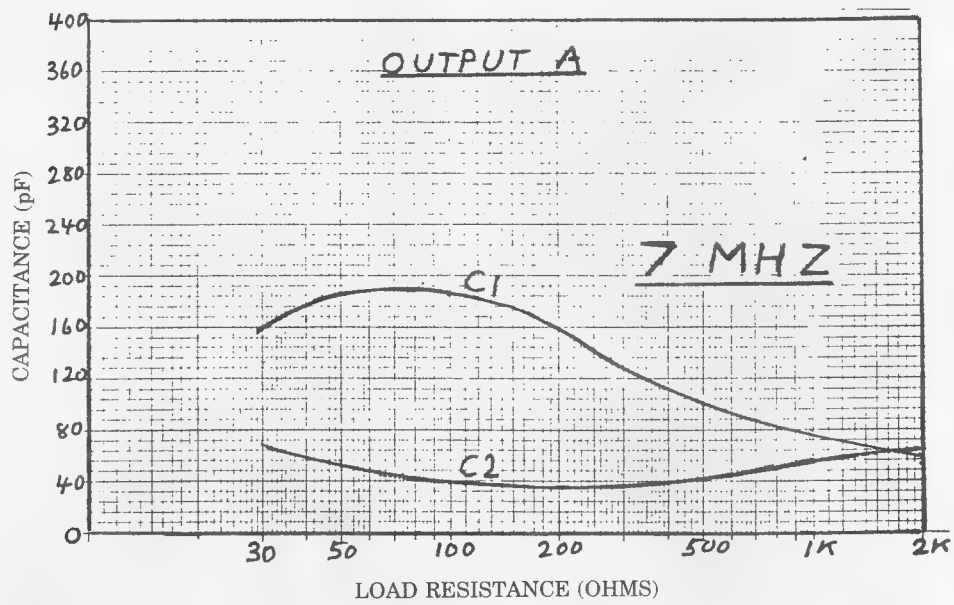



*Figure 3 Matching capacitance vs load resistance 7 MHz*

course, is provided the output circuits are switched as shown in the curves to suit the particular load resistance. Extrapolating the curves beyond 30 and 2000 ohms, a wider resistance range could be envisaged. Furthermore, additional tests have shown that the Z match unit can also cope with a wide range of reactive values in the antenna load.

## Tuning

Generally speaking, a match is achieved by adjusting the two capacitors, one after the other a number of times, until either the best SWR is achieved with transmitter carrier on or, if using a noise bridge, a noise null is detected in the receiver. I have found that the result can be improved by then shifting C1 a little, one way or the other off what appears to be the best adjustment and then readjusting C2 for best SWR or noise null. A little experimentation with C1 moved one way or the other can produce a precise match.

The Z match tuning, for a good match, is fairly critical and a five-to-one vernier dial attached to each capacitor shaft makes tuning easier. The reduction drive also assists in locking the setting of the capacitor; a very useful function in mobile applications.

## Conclusions

The tests confirm that, provided both output circuits are used at will over the whole frequency spectrum, the compact coil version of the Z match tuner (as described in "Random Radiators") can match a wide range of load impedances at frequencies inclusive of 3.5 to 28MHz. All of this has been well supported with practical results obtained by others in the field. However, it is nice to be able to specify the performance in more precise terms from measurements obtained at the test bench.

Further tests have indicated that there is no great problem of power loss in the tuner. Using the receiver type tuning capacitors (as specified), there might be a problem of arcing across the plates if high power were applied. If a high power linear amplifier were to be used, capacitors with greater plate spacing would be called for and, at 400pF maximum capacity, might be difficult to procure. As point out in "Random Radiators" there is no arcing problem with the receiver type tuning gangs if power is limited to 100 watts PEP.

The tuner can be made as quite a compact unit, suitable for use both at home and in the field. It is simple to assemble and as a construction project, well within capabilities of most radio amateurs. For more information on its construction, refer to the excellent de-

*(Continued onpage 25)*

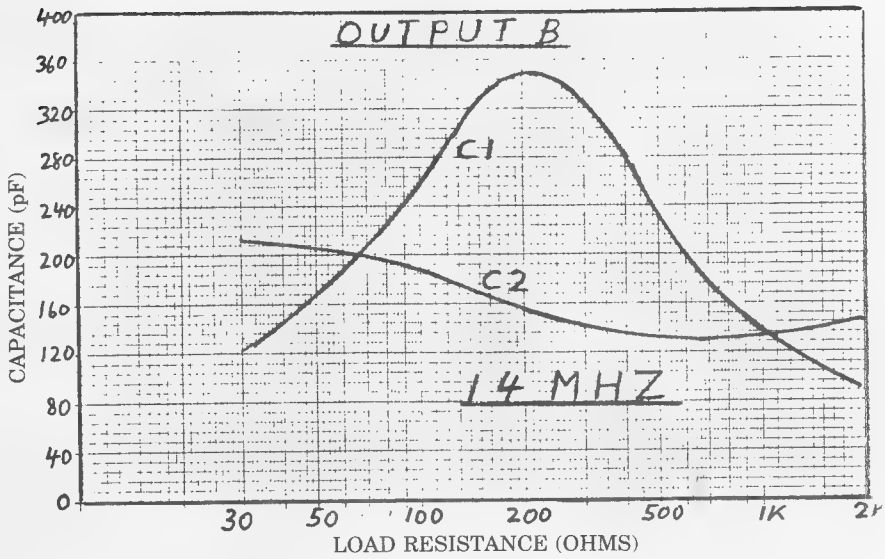



*Figure 4 Matching capacitance vs load resistance 14 MHz*

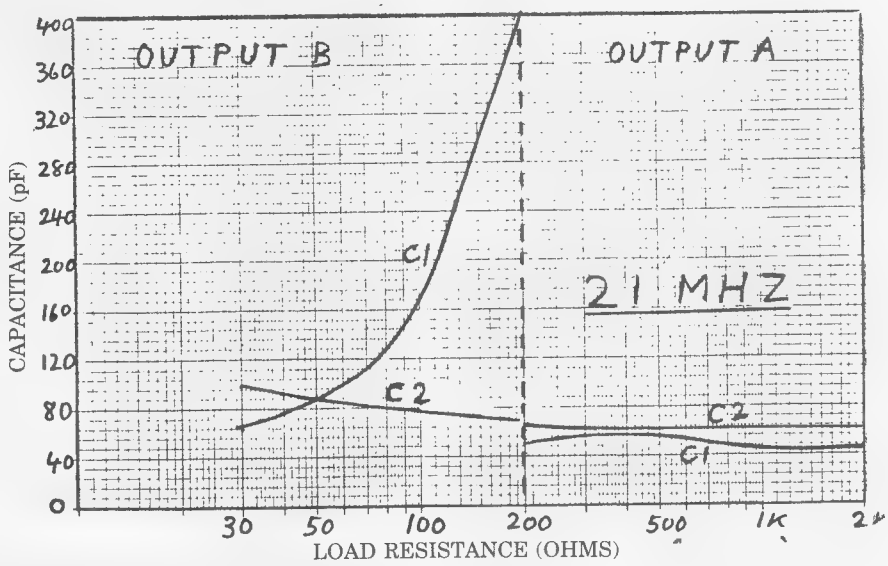



*Figure 5 Matching capacitance vs load resistance 21 MHz*

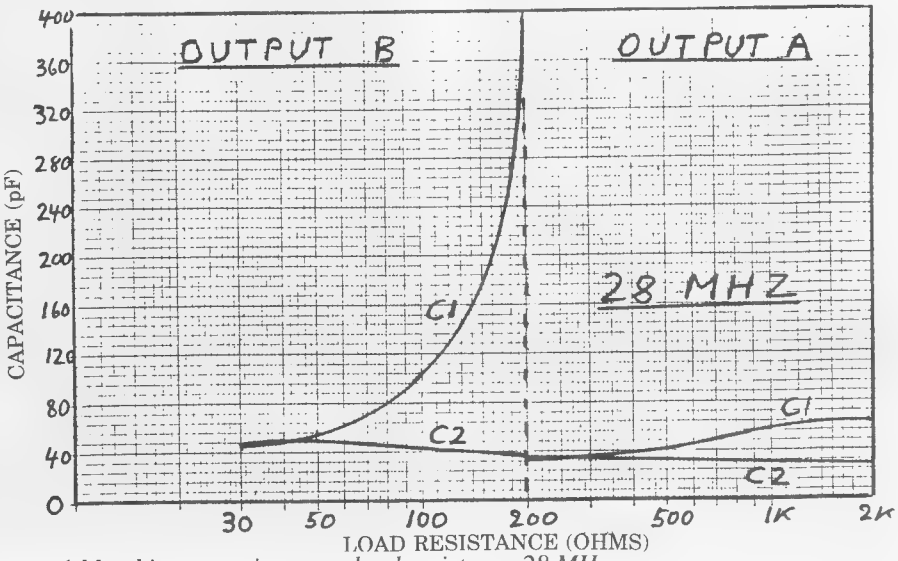



*Figure 6 Matching capacitance vs load resistance 28 MHz*

# HARRY ATKINSON VK6WZ — THE WIZARD OF WORDS

JOHN HAWKINS VK6HQ
39 GLYDE RD
LESMURDIE 6076

IF YOU'VE TUNED to the West Australian WIA news broadcast at 0130Z on Sunday mornings you must have noticed a certain professionalism in its presentation. This is no happy accident. Harry Atkinson VK6WZ is a former commercial radio announcer.

Harry, nevertheless, is the first to acknowledge that his WIA predecessor, Douglas VK6ZMG, did more to change the shape, sound and format of the WA broadcast than anyone else in 'living memory'. 'Living memory' for Harry reaches back 50 years to when he and two other stalwarts in turn cycled their ways to broadcast combined Morse practice/news bulletins from a second-floor room, corner of Hay and Milligan Streets, Perth.

The brown envelope authorising Harry to use the call VK6WZ landed in his letterbox circa 1937. Reminiscing, Harry says that crystal control was preferred at that time. Most new VKs saved for at least one crystal on each of the 80 and 40m bands. There wasn't a lot left over for fancy components — his first super-regenerative receiver even sported a wooden baseboard and a sheet steel panel. That didn't stop it performing well and led to projects like a one-valve TX using a gold-painted E415 tube by Philips. The input on 7MHz was a "mitey" 1.5 watts which fed into an SWF (single wire fed) antenna, akin to the Windom. Harry says that on winter evenings many a solid AM fone contact from Victoria Park to the eastern States was enjoyed.

Going back a bit, Harry's first job was compiling a magazine called *Wireless News,* but the Depression set in, hard times bit and work dried up. Eventually, however, he moved into a long association with commercial radio, commencing in 1939 with 6GE Geraldton. It was with 6GE that a touch of VK6WZ innovation, coupled with assistance from the Australian Comforts Fund, enabled scores of tiptoeing, heavily booted soldiers to say a few words to mums and dads over the radio before embarking for service overseas. Messages were piped live by landline to Perth where they were cut directly on to 16" discs then despatched under plain white labels to eastern States broadcast stations for transmission. Due to censorship rules listeners were not permitted to know where the participants were at the time of recording, or whence they were bound.

Another VK6WZ first came about through the importation of an up-to-the-minute 12V to 240-VAC 50Hz inverter from the USA. Harry seized the opportunity to exploit the new technology and record an interview while both he and the client were being driven in a car. The client was the wife of the local Ford franchise holder and the interview took place in the back seat of the latest from Henry T. "We were able to get a very good mark-up on that ad," quipped Harry, "as historically it had never happened before in WA."

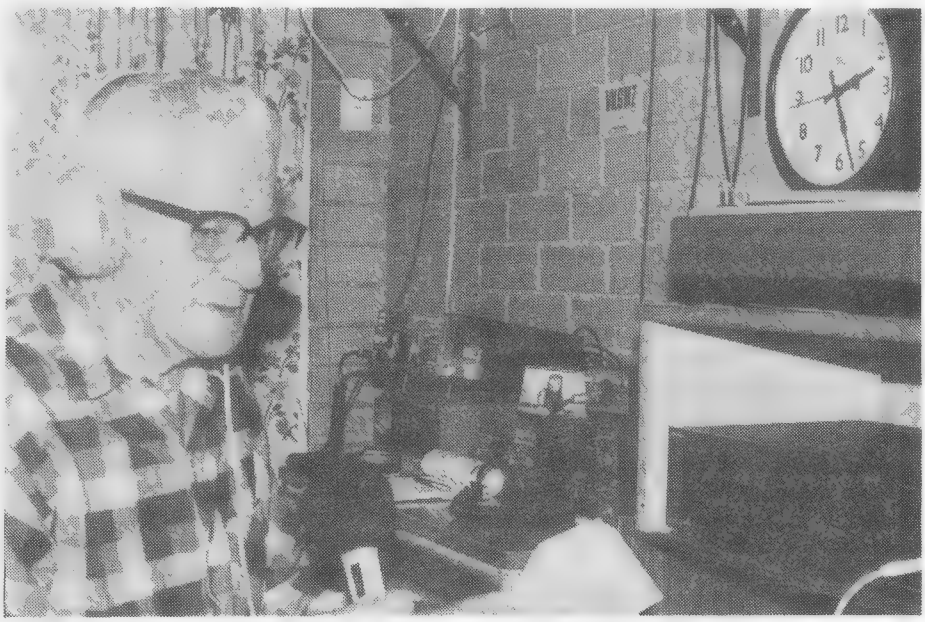
Harry was at 6GE for 16 years, excluding a spell in 1941 with 6KG Kalgoorlie as senior announcer. Facilities at 6KG were somewhat primitive in those days. For a start, there was no separate area where the manager could interview clients. Worse of all, equipment had to be homebrewed to cope with 220V DC mains! Two inverters hummed constantly in the roof space so that at least some, AC only, equipment could be run, but the turntables, acquired from the film industry, were about as quiet as shearing machines, and the mike just had to be 'killed' before a record could be started up. Even the strobes wouldn't work with the DC lighting.

Nineteen-fifty-five was a very good year for Harry when he took over a brand new station, 6VA Albany, and managed it for two years, glad of the state-of-the-art equipment.

Between 1958 and 1978, VK6WZ went QRT so far as commercial and amateur radio were concerned, focusing his talents on his own business in Albany town. Ties with audio were not altogether severed, as the business sold records, hi-fi and a custom-disc-cutting service.

Between 1967 and 1970 Harry returned for a brief stint at 6WB Katanning, and once more to 6VA. But, apart from a spot of volunteer announcing work with 6NR's "University of the Third Age", Harry retired, once and for all(?), in January 1980.

Once his business operations had ended, the rig was dusted off and there was time again to play amateur radio. Harry discovered that while he had been gone the hobby had metamorphosed. AM was OUT; SSB was IN. Homebrewing was less in evidence; rigs were becoming



*Harry Atkinson VK6WZ, pictured at his rig.*

readily available 'off the shelf'. Two-metre FM was also very much IN, which led, in due course, to Harry's involvement with the news broadcast.

Starting as early as Thursday and with a view to putting the finished program 'to bed' by PM Saturday at the latest, Harry compiles a heady half-hour of news and views for radio amateurs and shortwave listeners. Included are edited WIA lectures (especially for those who can't get to meetings), contributions from the clubs, WIA Federal news, diary notes, ionospheric information (in season) from Miles VK6ZRY and the WA disposals service, courtesy Roy VK6XV.

Whilst he can sometimes be heard on fone or CW, and occasionally viewed in person contemplating a claret at old-timers' meetings, Harry donates a fair bit of his time to the broadcast. My visit to Harry's "Tadis" type studio at the small unit in Mount Lawley was an eye-opener, and I use the metaphor advisedly. Whilst the quality of the broadcast hints not at the effort required, Harry has a severe vision handicap with which to cope, and is legally blind.

The broadcast is always scripted using a large-print typewriter, then transposed via an AKG mike to a Marantz cassette tape recorder. This is done away from the transmit area for two reasons. Firstly, the Ferrograph reel-to-reel tapedeck used for break signs, test signals etc, together with the "Optolec" view, take up too much loungeroom space and, secondly, acoustics in the bedroom are enhanced by absorption by pillows and blankets!

The "Optolec" viewer, incidentally, comprises a black and white shop surveillance TV camera fitted with a zoom lens looking down upon an adjustable roller-table. Print placed on the table is magnified something like 40 times and comes up on the screen of a 25" TV set alongside.

Future plans? Well, much depends on what the Institute decides, but Harry foresees some news input into digital modes. He has reservations about the televising of WIA broadcasts but it very much in favour of the videotaping of WIA lectures and the airing of some of the audio component. Harry observes that repeater linking will eventually place good-quality transmittable 'copy' into remoter areas and extend the range of the broadcast.

I asked Harry if he had any idea of the number of broadcast listeners he has. He said he could only guess, but "in the trade", one letter received indicated about 100 listeners. As the call-backs on Perth Channel 2 repeater alone average 75 each week, and do not take into account relays as far-flung as Alice Springs, Harry's listening public must be quite substantial.

If you're reading this, the chances are there is at least one WA WIA broadcast source to which you could tune. A list of frequencies can always be found in 'AR'. Give Harry a call. Get a message back to the 'old pro', but don't tell him I put you up to it!

**ar**

## Tests on the Compact Coil Version of the Z Match Antenna Tuner *(Continued from page 23)*

scription given in "Random Radiators", reference 1.

In this final paragraph I draw attention to the fact that there are commercially made versions of the Z match unit. It would be interesting to know how they compare in terms of the coil specifications and the size of tuning capacitors. If you have such information, it might be interesting to send it in to 'AR', perhaps to the two Rons for their popular column.

### References


1. Random Radiators — Ron Cook VK3AFW & Ron Fisher VK3OM — *Amateur Radio,* March 1990
2. King A W W1CJL — The Z Match Antenna coupler *QST,* May 1955
3. *RSGB Handbook*
4. Lloyd Butler VK5BR — Analysis of the Z Match Antenna Tuner — *Amateur Radio,* May 1989
5. Dean Probert VK5LB — A Z Match Antenna Tuner — *Amateur Radio,* May 1989


### Table 1

### Comparison of Z Match Specifications

Allen W King W1CJL *QST* May 1955

| Winding | Diam | Turns | Length | Inductance* |
|---|---|---|---|---|
| L1 | 52.4mm | 5.5 | 41.3mm | 1.26µH |
| L2 | 66.7mm | 4.75 | 12.7mm | 2.31µH |
| L3 | 52.4mm | 7.75 | 31.8mm | 2.93µH |
| L4 | 66.7mm | 6.5 | 15.9mm | 4.03µH |

Tuning Capacitors C1=340pF, C2=2x250pF

| Winding | Diam | Turns | Length | Inductance* |
|---|---|---|---|---|
| L1 | 63.5mm | 5 | 25.4mm | 1.84µH |
| L2 | 76.2mm | 5 | 25.4mm | 2.4µH |
| L3 | 63.5mm | 8 | 44.5mm | 3.5µH |
| L4 | 76.2mm | 6 | 31.8mm | 3.1µH |

Tuning Capacitors C1=500pF, C2=2x250pF

Random Radiators — *Amateur Radio* March 1990

| Winding | Diam | Turns | Length | Inductance* |
|---|---|---|---|---|
| L1 | 40mm | 7 | 30mm | 1.57µH |
| L2 | 50mm | 6 | 25mm | 1.85µH |
| L3 | 40mm | 10 | 45mm | 2.52µH |
| L4 | 50mm | 7 | 30mm | 2.28µH |

Tuning Capacitors C1=300pF, C2=2x400pF

*Inductance calculated from Wheeler's formula

**ar**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# VNG — HOW TO USE IT

QUINTIN FOSTER
77 CHURCH ST
BEAUMARIS 3193

WE HAVE ALL HEARD VNG, a time signal and standard frequency station at Llandilo, New South Wales, beeping away on 5, 10 and 15MHz, but do we use it to the best advantage?

The purpose of this article is to explain how the time signals are arranged to show the day of the year, the hour (UTC) and the minutes of the hour.

Details of VNG transmissions and the time-code format are given below. VNG's emission is double-sideband full-carrier amplitude modulated telephony, so a simple short-wave receiver is all that is needed to receive the signals.

The time-signal information is transmitted using a basic 1000Hz tone of varying lengths. These tones as shown in the time-code format are:

500ms — Minute pulse

200ms — Second marker No 20 — designates the start of the time information. Also used for binary '1'.

100ms — Binary '0'

50ms — Seconds marker (not part of BCD time code)

5ms — Seconds marker 55-58, or seconds marker 50-58, during 5th, 10th, 15th etc minute.

For most practical purposes we listen to these time signals so, first of all, we should be able to identify the different signals in way as we do with the Morse code.

The first signal to identify is the long minute pulse of 500ms. Listen for this several times and then, using the time-code format, count down to No 20 to identify the seconds marker 20. Then count through the minute, hour and day of year signals until you come to four distinct "toc" sounding signals just before the minute pulse. If it is the 5th, 10th, 15th, 20th etc minute you will hear nine "tocs", not four, before the minute pulse.

Follow this routine, using the time-code format, for several minutes until you can positively identify the minute pulse, seconds marker, minute-hour-day-of-year section (more details later) and the toc signals.

The figure shows the time signals for day 156, hour 0600 UTC, next minute 15.

In the minute section, the

| | |
|---|---|
| 21st second marker is a binary 1 | = 1 |
| 22nd second marker is a binary 0 | = 0 |
| 23rd second marker is a binary 1 | = 4 |
| 24th second marker is a binary 0 | = 0 |
| 25th second marker is a binary 1 | = 10 |
| 26th second marker is a binary 0 | = 0 |
| 27th second marker is a binary 0 | = 0 |
| | 15 |

The 28th second marker is a binary 1 and is a parity bit. Counting binary "ones" plus the corresponding parity bit gives an even number (in this case, 16).

A simple way of identifying the signals is to write a dash for a long signal (200ms, binary 1) and a dot for binary 0 (short signal, 100ms) under the appropriate second marker, then add up the values given to each binary 1 as shown above.

Similarly, in the hour section the

| | |
|---|---|
| 29th second marker is a binary 0 | = 0 |
| 30th second marker is a binary 1 | = 2 |
| 31st second marker is a binary 1 | = 4 |
| 32nd second marker is a binary 0 | = 0 |
| 33rd second marker is a binary 0 | = 0 |
| 34th second marker is a binary 0 | = 0 |
| 35th second marker is a binary 0 (parity bit) | |
| | 6 |

Likewise, the day-of-the-year section equates to the 156th day of the year — 5 June.

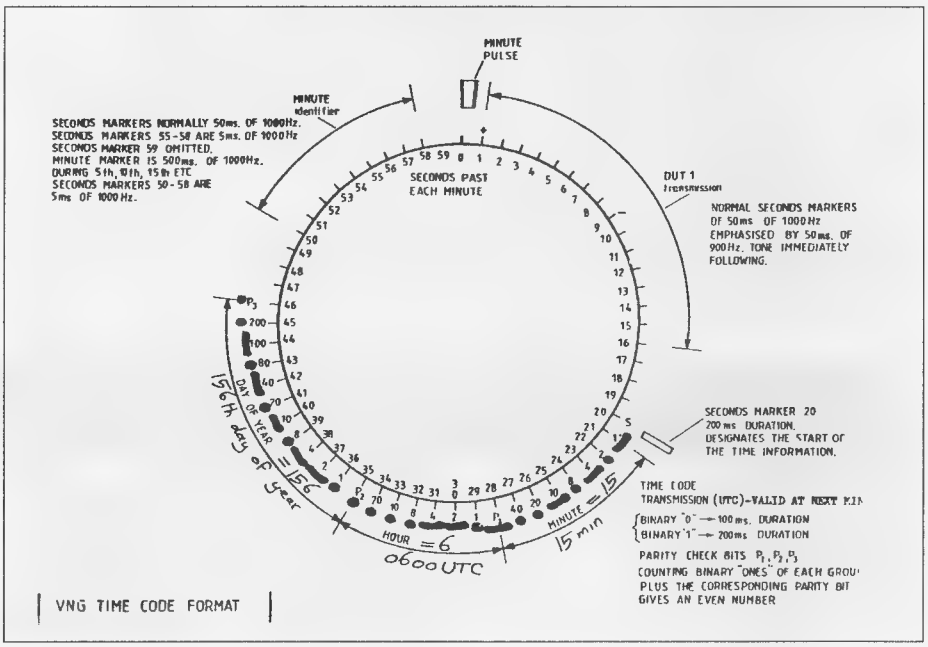
As the minute is the 15th past the hour you will hear nine "tocs" before the minute pulse and the time then will be 5 June 0600 UTC plus 15 minutes.

It is a good idea to have a timepiece which shows the correct time, more or less, so that you will have a fair idea of what the time should be when you are dividing the minute, day and hour sections until you feel confident that you can get it right. Of course you can check your time by waiting until you hear:

a) the voice announcement just before the hour, and then every 15 minutes;

b) the nine "tocs" which indicate the 5th, 10th, 15th etc minute. There are no time pips on 15 and 10 MHz during the 9th, 10th and 11th minutes, and also from the 46th to the 52nd minutes inclusive. Good use can always be made of the carrier-only period for alignment and frequency checking purposes.

Note: The continuation of Government funding for VNG is dependent on contributions from users. If you wish to help, write to: VNG Users Consortium, GPO Box 1090, Canberra, Act, 2601.



VNG TIME CODE FORMAT

# DXPEDITION — CONWAY REEF

STEPHEN PALL VK2PS
PO BOX 93
DURAL NSW 2158

IT WAS IN LATE JULY, in the afternoon, in 1989. As usual, I was checking the band and propagation conditions, moving along with the dial on 21 MHz. Suddenly, on 21295, I heard a strong signal and an interesting QSO which was between a European station and a 'maritime mobile' in the South Pacific. DXers usually do not chase maritime mobile stations, as a QSO with such a station cannot be used for DXCC purposes, even if the callsign used by the marine operator is a very exotic one. This QSO was different. The discussion between the two stations indicated that a group of mostly German radio amateurs, DJ6SI Baldur, DJ6JC Henry, DK2WV Karl and Vince K5VT were on their way to Conway Reef for a short DXpedition.

Conway Reef—the Fijians call it Ceva-I-Ra, the 'island of the south and west'—belongs to Fiji, and lies about 300 miles in a south-westerly direction from Fiji's main island, Viti Levu. (21°44' south 174°38' east). It is a coral reef of about 2400 metres in length, and the highest point of the reef is about 1.5 metres (five feet), a 900m long sandbank with very sparse and weatherbeaten vegetation. The many shipwrecks around the reef are witness to the strong and treacherous conditions of the seas and to the ship navigators of the past who lost their way around this part of the South Pacific.

Conway Reef was discovered in 1838 by an Englishman named Drinkwater Bethune, who was the captain of the British ship "Conway". Henry Mangeles, who commanded the British surveyor ship "Herald", visited the reef in 1856. The reef is now part of Fiji and, after Fiji gained independence, it was renamed Ceva-I-Ra in 1976.

But, back to our maritime mobile radio amateurs, who were on their way to this tiny speck of sand on the sailing boat "Seax of Legra". The trip to the reef took three days from Suva. Landing on the reef was quite difficult due to the breakers. The landing took part in small rubber/plastic inflatable boats, but they made it in several trips without mishap. With the help of some driftwood found on the reef, and plastic sheeting, a real open-ended 'shack' was created which housed the radio equipment and gave limited protection against the frequent rain squalls which plagued the expedition during their 88 hours of stay on the reef.

*The DXpeditioners busy on the island*

Soon after landing, there was a hive of activity to establish the three transmitting stations and get the generators going. The expeditioners used their individual callsigns, 3D2HL, 3D2SI, 3D2VT and 3D2WV, and they were operating on the usual DX bands in the SSB, CW and RTTY modes. The expedition was well equipped: three 900W generators for power, three IC-735s, automatic antenna tuners, Ten-Tec Corsair transmitter and FT757 as a reserve transceiver, amplifiers, and even a miniature distress rig for 15 metres.The main antennas were a two-element Fritzel-beam, a 10m high fibreglass quarter vertical for 7 MHz, and another 12m high fibreglass mast for a random antenna, a Butternut for 40, 80 and 160 metres and, of course, all other wires, cables and necessary odds and ends.

During the three and a half days, the expedition made 6000 SSB QSOs (DK2WV and K5VT as 3D2WV and 3D2VT), 7000 CW contacts (DJ6SI and K5VT as 3D2SI and 3D2VT) and 1000 RTTY contacts (DJ6JC as 3D2HL). The approximate regional distribution of QSOs was as follows: Japan 35 per cent; North America 40 per cent; Australia/New Zealand 15 per cent; Europe and others 10 per cent.

On the third day the sun finally came out from the rainclouds and shone on the weary, sleepless, wet group of amateurs. During the short stay the boat "Seax of Legra" lay at anchor at a safe distance from the reef and supplied the four operators and Frank, the generator mechanic (a non-amateur expedition member), with one hot meal per day, using the inflatable boats for transport.

Every good thing, even a DXpedition, comes to an end. After 88 hours of operation, and satisfied with its success, the group headed back to Suva, which took four days. They travelled from Suva via the USA back to Germany, with a short break to attend a DX party in their honour in W6.

The sudden appearance of the July 1989 Conway DXpedition took the amateur world by surprise, as there was practically no advance publicity. The expedition had to be put together at very short notice, as the timing was dependent on Vince K5VT, who had some difficulty obtaining a short leave from his responsible position as a well-known Phoenix, Arizona, surgeon. For those who want to know even more personal details: the members of the expedition financed the trip themselves to the tune of DM6500 each, which equals roughly $A5200 each.

The first DXpedition to Conway Reef took place a few months before, in April 1989. The German group DF3KX, DF9KH, DJ9ON, DK9KX and DL8CM operated from Conway under the callsign 2D2CR.

Conway Reef has now been accepted as a new DXCC country on the grounds of the distance from Fiji's main island, and QSL cards are now accepted by the ARRL for DXCC purposes as from 1 March 1990.

Finally, I would like to thank Karl DK2WV, who was kind enough to supply the information without which this report would not have been possible. **ar**

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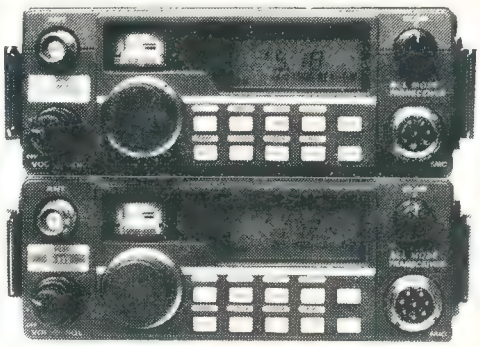

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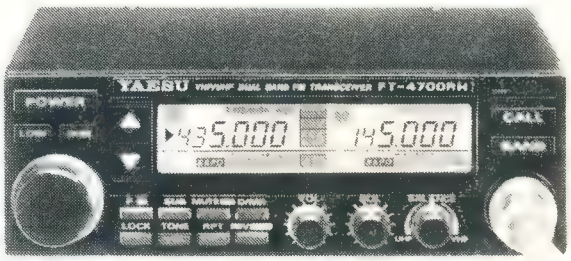

Features 50 watts output on 2 metres (144-148MHz), and 40 watts output on 70cm (430-450MHz), with an inbuilt cooling fan for long term reliability. Full-duplex crossband operation or dual-band reception modes are provided, so you can listen for calls on both bands simultaneously, or work someone on one band while also listening on the other band. The **bonus** YSK-4700 extension cable allows the main body of the transciever to be installed remotely, while the front panel mounts conveniently on the dashboard. On the front panel the amber back-lit LCD shows both VHF and UHF frequencies and signal strengths, and all controls are back-lit for clear readability, with a dimmer switch for nightime viewing. A total of 20 memories and 5 selectable tuning steps make frequency selection easy, while the advanced scanning features allow quick detection of signals on either, or both bands. See ARA review Vol. 12 Issue 11 (Feb 1990), or A.R. review May '89.

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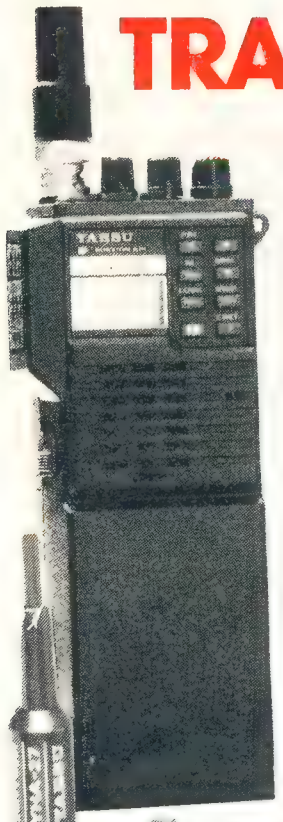

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# A JAPAN ODYSSEY

TERRY ROBINSON VK3DWZ
21 RUSSELL AVE
WOODEND 3442

MACHINES THAT PLAY a melody as they dispense drinks; lifts that talk; incredible overcrowding; sumo wrestlers; incredible efficiency; trains that travel at 240kph. These are just some of the many things you'll experience if you visit Japan.

After many years as a monitor for Radio Japan, I finally decided to take the plunge and visit the country. I was not disappointed. It's the most exciting nation on earth!

Japan has the reputation for being outrageously expensive. ABSOLUTELY NOT! Sure, some accommodation, food and travel can be overpriced, but average prices are considerably below ours. Competition sees to that.

In my case I was able to get a super bargain in both accommodation and air travel, courtesy of Qantas.

Stepping off the plane at Narita, it seems like any airport in any country. It's not until you enter the immigration area that you finally realise here that Japanese and foreigners have to go through separate gates. As our flight contained hardly any non-Japanese, clearing immigration was relatively painless.

You collect your luggage; now the fun starts. *Lesson 1:* In Japan, everyone speaks Japanese — virtually no one speaks English! Luckily, in my case, transport to my hotel was pre-arranged. Finding the right queue was difficult, but not impossible.

*Lesson 2:* **Learn to Love the Yamanote Line:** So said one of my guidebooks. We took the book's advice and arranged hotel accommodation near one of this train-line's stations. In this case it was Ikebukuro, 150 metres from the hotel.

The Ikebukuro station is a huge underground station that services several JR (Japan Railways) and private train-lines.

The JR Yamanote Line, above-ground, encircles Tokyo. Some of its stops are Tokyo, Akihabara, Ueno (for the bullet train north), Harajuku (for Yoyogi Park and NHK/Radio Japan) and Shinjuku (for the nightlife).

Train travel on non-JR trains seems to be virtually impossible due to the scarcity of information in English. JR stations usually have just enough English-language signs to enable a non-Japanese person to travel around safely.

*Lesson 3:* As an independent traveller in Japan, don't expect to get very far if you pay for each ticket as you travel. Not only is travel expensive, but finding someone who understands English (and can tell you the correct fare) ranges somewhere between difficult and impossible.

A neat solution is to purchase a "JR Pass" *before* leaving Australia. Although initially expensive, the saving in both time and money is immense. And you can certainly get your money's worth. A trip from say, Tokyo to Kyoto on the shinkansen (bullet train) can cost almost as much as a seven-day pass. With the pass, **all** trips on JR trains, buses and ferries are **free** for the duration of the pass. You could spend all your time in Japan just riding the trains and spending virtually no money at all!

Not likely, though. Japan is a consumer's paradise. Shops are packed floor-to-ceiling with every item imaginable.

Akihabara has been described as the world's largest electronic bargain basement. Over 600 shops sell all manner of merchandise from capacitors to stereo systems. Some tiny little shops sell only one item! One shop may sell transformers, another resistors and yet another integrated circuits. One tiny shop I went to — several times — sold nothing but cartridges for playing long-playing gramophone records. I eventually purchased an Audio Technica AT-F5 at almost **half** the Australian price.

At Akihabara, as soon as you leave the station you see brightly coloured signs everywhere, and open-fronted shops selling things like Walkmans, tiny LCD colour TVs and portable radios, usually on the ground floor. On the first floor, the shop may sell large TV sets and video cameras. On the second floor, there could be hi-fi systems.

On the third floor, there are likely to be any number of computers and machines selling software (usually surrounded by young Japanese). On the fourth floor, home electrical appliances may be sold. Here, you will find kitchen appliances not seen in Australia.

The top floor may be allocated to amateur radio and shortwave. Receivers and transceivers are not only on display but they are actually connected up so it's possible to try them out before purchase.

Learning Morse code for your amateur "ticket"? Not only were Morse keys on open display, but they were all connected to an oscillator so you could "try before you buy". Japanese amateurs must laugh at us and our archaic retail practices. I purchased in one of these shops the (then) latest issue of the Japanese amateur magazine 'CQ'. In its 540 pages (and two loose booklets) are contained all manner of news, construction articles and any number of colourful advertisements. Imported military receivers (like my R-390A) are listed in the back at amazingly high prices.

The range of Japanese-made radios is immense. Sony would have the largest range of any manufacturer in the world. Probably the most unique was one the size of a credit card. These are available for both AM and FM or AM only/FM only. Or they are available pre-tuned to just **one** station, such as FM Yokohama on 84.7MHz (the Japanese FM band runs from 76-90MHz).

It's difficult to quote prices here. "Official" prices (already up to 50 per cent below ours) can be subject to a "discount" of 10-20 per cent. In a Japanese catalogue I have in front of me, the Sony ICF-SW1S is listed at Y46,000 ($396). The price you would eventually pay, however, could be as low as $350.

The AC supply is a very strange 100V, 50/60Hz, so mains-powered equipment may not work here. Of course, suitable transformers can be purchased in Akihabara. I purchased a Sony Walkman of a type not yet available here. It's unique in that it incorporates a small FM transmitter in the main body and a completely separate FM radio to receive either "transmissions" from the Walkman, or normal off-air ones. The unit uses tiny re-chargeable 1.2V cells and a 100V charger is supplied. For about $8.60 I was able to purchase a small 120V transformer (I have both 240 and 120V available) from a small shop in Akihabara.

Japan has many television channels available. NHK has four services (two on VHF and two on direct-broadcast satellite) — the rest are "commercial", with advertisements sensibly placed, between programs and only occasionally during them.

In my hotel, there seemed to be about 20 channels available. Some consisted of closed-circuit "information" programs that told about the hotel, how to travel

around Tokyo and so on. Four 'pay' channels offered 'adult' movies. Also available was a special "cable" channel that had programs exclusively in English. Most of the programming seemed to come directly from the US via satellite.

Of course, all the normal programming was in Japanese, but occasionally an "English" movie was shown. Using an ingenious button on the TV remote control, either the original sound-track or a "dubbed" one could be heard. It was fun to hear the US actor, Gene Hackman, speaking in Japanese!

Fast-food outlets and cafes are everywhere. I ate plenty of "real" Japanese food — some almost inedible, but most rather enjoyable. I can recommend tempura.

A trip on the shinkansen (bullet train to you) is an absolute must. The first one I took was, more or less, a "lucky dip". I just went to Tokyo station, found the booking office and went in. "Can I have a ride on the Shinkansen?" The man behind the desk spoke no English — he showed me a map entirely in Japanese. I pointed a finger somewhere south of Tokyo and, within a few moments, a ticket was printed. My heart sank — it was entirely in Japanese (what else!). Luckily there was just enough English (some figures) to allow me to find the right platform (just as the train was leaving) and the correct seat. Further examination (of the ticket) showed departure and arrival times. I still hadn't a clue where I was going!

At the exact arrival time printed on the ticket, the train pulled into Kyoto station. The journey had taken just under 2.5 hours; Kyoto is 530km south of Tokyo. Back in Australia some people don't believe I travelled all that distance in just five hours (remember, I had to return). Hah, I have a souvenir to prove it.

For some time now, I have been a technical monitor for Radio Japan. The former gentleman in charge was Mr Youjiro Kume. We have spoken (by telephone) several times. He and Radio Japan went out of their way to make my trip enjoyable.

I first spoke to Mr Kume at his home on my first afternoon in Tokyo. He speaks excellent English. We met at my hotel first, then he invited me to visit Radio Japan a few days later.

The NHK building houses all NHK facilities in Japan and, like many other things in Tokyo, is huge. Radio Japan occupies two (very cramped) floors. I met several of the English-language staff. Later I discovered that one, Mr Sakuri, did the Japanese speaking part on a Japanese-language course I have!

After looking at the NHK production facilities, Mr Kume took me to his house. I saw that Japanese houses are not nearly as small as I'd thought. Blocks of land are small, but two-storey houses seem to be common so the living space is similar to ours.

I met Mr Kume's charming wife (who spoke no English) and we ate a meal of Japanese food that was most enjoyable. *Lesson 4:* the only place to find **real** Japanese food is in Japan (don't expect a knife and fork; it's always chopsticks!) I was then invited to take part in a Japanese tea ceremony conducted by Mr Kume and his wife, in a special room at his house.

The Japanese have a system that makes cars virtually worthless after a few years. This is good for their motor industry, but it must cause problems every few years when the average Japanese has to fork out for yet another new car. They certainly have their priorities right when it comes to good road maintenance, though.

Accommodation prices range from affordable to ridiculous. In my case, the hotel, although expensive by our standards, was all that I could have wished for. The room I had was on the 20th floor, with a magnificent view over Tokyo. Although small, every conceivable item a traveller could ever want was available, even a second telephone in the bathroom!

The "general store" in the hotel was like nothing I had ever seen before. Souvenirs, medicines, books and magazines — English and Japanese — and all manner of useful items. And another convenience store across the road!

One destination that is compulsory for any tourist is **Nikko.** There are two ways of getting there by train. A private-line train from Asakusa will take you directly there (but you have to find the station and pay), or JR offers a shinkansen train from Ueno to Utsonomiy, then a small, local train for the rest of the journey. This is the best way to go as the little train travels through the countryside, stopping at small railway stations and so you have a chance to experience the "real" Japan.

Nikko offers some spectacular temples, and you will be overcome by their beauty.

Two other places are The Ginza (a part of Tokyo) and Mt Fuji. I found the Ginza almost by accident when on a "private" train to somewhere (don't ask me where). The Ginza has the world's most expensive real estate and the swankiest shops this side of Fifth Avenue. If you haven't visited The Ginza, you haven't visited Japan.

If there's one highlight of the place, it must be the Sony building. It looks pretty ordinary from the outside, but inside it's unique. You take the lift to the fifth floor then walk down to each showroom going clockwise. Sony products are on display and available for use. I "played" with portable compact disc player, short-wave radios, a portable DAT (digital audio tape) machine and, my favourite, the CRF-V21 receiver. Also on display was a very large TV set showing high-definition TV.

Mr Kume took me to the "lakes" area adjacent to Mt Fuji. We travelled around the largest lake in a boat shaped like a dolphin! I saw Mt Fuji many times that day and even have a photo (of me in front of Mt Fuji) to prove it.

Now, a little more about radio. I took along a little Sony ICF-7600D receiver and its companion power supply (set to 110V, it worked well on 100V). There were few medium wave frequencies clear of Japanese stations, although I heard some (unidentified) Soviet and Korean stations on the lower end of the band. On 810kHz the US Far East Network can be heard, usually with telephone grade audio. Programs seem to consist of little more than baseball!

On FM, a variety of programs was heard. NHK had a lot of serious music.

I returned to NHK on Saturday morning just before the taping of "Hello From Tokyo" and "DX Corner". Both programs were in the final stages of preparation when I arrived.

Once again, I met Kiyoko Tanake who, with David Powers, is the presenter of "Hello". Then, we went down to the studio for the first taping. Most of the studio equipment seemed to be rather elderly, although two almost new compact disc players were used for the music segments. Then it happened . . .

The familiar theme music for "Hello" finished. The producer, Mr Takeshi, went into the studio and came out a moment later. "Would you like to come in and be interviewed for the program?" How could I refuse. So it was a very nervous yours truly who sat in the small studio being interviewed by the presenters of my favourite Radio Japan program.

After that it was back to the main office to prepare for "DX Corner" presented by a delightful lady, Rika Kobayashi. Then, sadly, it was farewell to NHK (and I was given a gift of a small world clock and a packet of coasters) and the final lunch, of tempura, that I mentioned earlier.

The trip back to Melbourne was fun. The plane was almost empty! After Japan, no wonder. Who wants to come to gloomy old Melbourne?

How to sum up Tokyo? Big, brash, Westernised but uniquely Japanese.

Everyone should experience Japan at least once in their lifetime — but then once is hardly likely to prove enough. **ar**

# CONTESTS

JOHN MARTIN VK3ZJC
MANAGER, ROSS HULL CONTEST

## Ross Hull Contest

A correction to last month's information: in the sample scoring table at the top of page 33, the multipliers were shifted one column to the right. They should have read: 6 metres x 1, 2 metres x 3 etc.

## Using Locators

With scoring based on distance, it is necessary to know whether each contact is above or below the nearest multiple of 100 km. The simplest way to do this is with a ruler and a map, but it is also possible to get quite accurate measurements from Maidenhead locators.

Each locator square covers an area of two degrees of longitude and one degree of latitude. For example, the square PF94 covers the area 138-140 degrees east and 35-36 degrees south. The distance between adjacent squares in the north-south direction is 1/360th of the earth's circumference — about 111 km. The east-west "width" of the squares varies from about 222 km at the equator to zero at the poles.

The accuracy of four-digit locators is limited by the fact that a station may be located anywhere in its square. The possible north-south error is about ± 88 km. The same error may occur for both stations, so the worst case error for four-digit locators is equal to the size of one whole locator square.

Far better accuracy can be obtained with six-digit locators, eg PF94GH. The fifth and sixth digits divide each square into 24 x 24 "sub-squares", each five by two-and-a-half degrees. Again using Melbourne's latitude, the possible error is about ± 2.25 km north-south and ± 3.67 km east-west. This is far beyond the accuracy needed for the Ross Hull Contest.

If you know your latitude and longitude, the simple computer program below will find your six-digit locator, so you can quote it to other stations during the contest.

The program inputs your co-ordinates in degrees, minutes and seconds, and converts these figures to a total number of minutes east of the International Date Line and north of the South Pole. These numbers are then converted into the corresponding locator number.

The program is simple and has no error trapping, so you can get ridiculous results if you deliberately enter impossible figures. It was written in GW Basic but is fairly universal. For use on an Apple, change the 'CLS' command to 'HOME', and replace lines 190 and 195 as follows:

190 GET K$: IF K$ = CHR$(13) THEN 110
195 END

If the program crashes, check what you typed in, especially the colons, semi-colons and mathematical signs. Note that there is no space between the quotation marks in lines 170 and 190.

Next month we will present a second short program which will accept two station locators and find the approximate distance between them — this will enable you to make the distance estimates for your Ross Hull log.

## 14th West Australian Annual 3.5 MHz Contest (from VK6NK)

| | Call Sign | No. of Points |
|---|---|---|
| CW | VK6ELL | 1940 |
| | VK6BN | 1582 |
| | VK6AF | 1400 |
| | VK6RF | 980 |
| | VK6BEB | 804 |
| SSB | VK6ELL | 5292 |
| | VK6RG | 5152 |
| | VK6IU | 3510 |
| | VK6AMB | 3146 |
| | VK6DC | 800 |
| | VK6EJ | 720 |
| | VK6BBB | 576 |

## Program: Six Digit Locator Finder

```
100  REM ------------------ Lat & Long to Locator Converter ------------------
105  DIM C(6)
110  CLS: PRINT "To find your locator square:": PRINT
115  PRINT "Enter your latitude and longitude in degrees, minutes, and seconds."
120  PRINT "Type the three figures separated by commas.": PRINT
125  INPUT "Latitude              "; ND,NM,NS: NM = ND * 60 + NM + NS / 60
130  INPUT "North or South (N/S) "; NS$: IF NS$ = "S" OR NS$ = "s" THEN NM = -NM
135  INPUT "Longitude             "; ED,EM,ES: EM = ED * 60 + EM + ES / 60
140  INPUT "East or West (E/W)   "; EW$: IF EW$ = "W" OR EW$ = "w" THEN EM = -EM
145  EM = 10800 + EM: NM = 5400 + NM
150  C(1) = INT (EM / 1200): EM = EM - C(1) * 1200
155  C(3) = INT (EM / 120): EM = EM - C(3) * 120: C(5) = INT (EM / 5)
160  C(2) = INT (NM / 600): NM = NM - C(2) * 600
165  C(4) = INT (NM / 60): NM = NM - C(4) * 60: C(6) = INT (NM / 2.5)
170  L$ = "": RESTORE: DATA 65,65,48,48,65,65
175  FOR N = 1 TO 6: READ D(N): L$ = L$ + CHR$ (D(N) + C(N)): NEXT
180  PRINT: PRINT "Six-digit locator is:  "; L$: PRINT
185  PRINT "Options:  <RETURN> to run again  <ANY OTHER KEY> to quit"
190  K$ = INKEY$: IF K$ = "" THEN 190
195  IF K$ = CHR$(13) THEN 110 ELSE END
```

## 1990 Australasian Sprint Results

Entries for the fifth series of Australasian Sprints totalled 13 in the CW section (down one from last year) and 33 in the Phone section (up by 10) which was fairly pleasing. The CW scores were about average, but those in the Phone section were significantly higher than for 1989. Some operators experienced difficulties, but all those who added comments to their entries appear to have thoroughly enjoyed themselves.

The Adelaide Hills Amateur Radio Society and the South Australian divisions of the WIA congratulate the overall winner, and also the winners in the individual call areas. I say overall winner because, for the first time, one operator has recorded the highest score in both sections. A great effort by Roger Crofts VK4YB, who also finished high in the lists of both sections last year.

It was pleasing that the three novices who entered the Phone Sprint had very good scores, but disappointing that none entered a log in the CW section, even though a quick scan of other logs indicates that a few were operating. Speaking of logs, I continue to be mystified as to why only about half the operators taking part in the contests actually submit entries. Some holders of quite familiar callsigns did not. Perhaps next year will be better.

This year was notable for (I think) the first entries from a P2 station and from an SWL.

Lists of the logs submitted, together with the points claimed (or in a few cases, points allowed), are shown below. Certificate winners are indicated by asterisks.

### CW Sprint

| | | |
|---|---|---|
| ZL1GQ | * | 19 |
| ZM2IN | * | 16 |
| VK2AIC | * | 17 |
| VK3JA | * | 19 |
| VK4YB | * | 23 |
| VK4SSB | | 14 |
| VK4SF | | 11 |
| VK4YB | * | 63 |
| VK4JO | | 57 |
| VK4OD | | 48 |
| VK4ACC | | 25 |
| VK5AGX | * | 21 |
| VK5AFO | | 15 |
| VK5ADD | | 13 |
| VK6AF | * | 13 |
| VK7HX | * | 9 |
| VK8AV | * | 14 |
| VK5AFO | * | 51 |
| VK5NOD | | 48 |
| VK5KGS | | 39 |
| VK5ZD | | 35 |
| VK5RV | | 33 |
| VK5RG | | 27 |
| VK5TY | | 25 |
| VK5ZQ | | 23 |
| VK5PEB | | 23 |
| VK5ANW | | 21 |
| VK5AGI | | 19 |
| VK6APK | * | 23 |
| VK7HX | * | 33 |
| VK8AV | * | 41 |
| VK-L 40018 | * | 36 |

### Phone Sprint

| | | |
|---|---|---|
| ZL1GQ | * | 35 |
| ZL2AJB | * | 9 |
| P29RB | * | 3 |
| VK1EV | * | 18 |
| VK2RJ | * | 46 |
| VK2LEE | * | 46 |
| VK2AIC | | 22 |
| VK2KTV/MM | | 22 |
| VK3YH | * | 57 |
| VK3NKP | | 49 |
| VK3APC | | 48 |
| VK3CTK | | 43 |
| VK3JA | | 39 |
| VK3DD | | 23 |

### Some operator comments:

CW Sprint

ZL1GQ — Contest fell within the NZART

Memorial Contest but the two are compatible and could be mutually beneficial. Enjoyed the hour and wants to enter next year.

ZM2IN Interesting exercise but disappointed at the low numbers. Expected the hour to be hectic but turned out leisurely.

VK4SF Starting to believe CW is a dying art — the number of CW stations is getting less each year.

VK5AGX A pleasant hour well spent, but why so many absentees? Did not hear or work one novice — a great pity.

VK5ADD Thanks again for this hour of fun.

## Phone Sprint

VK7HX My kind of contest — very enjoyable. Looking forward to next year.

VK2LEE Can't wait for the next sprint — see you all again next year.

VK2KTV MM Bass Strait. Enjoyed the contest very much.

L40018 Enjoyed the contest very much, first for me and only for one hour.

VK4OD Always a lot of fun. QRN early but did improve. Lots of stations seemed to appear near the end of the hour.

VK4JO The Sprint gets more enjoyable every year. This was my third and I hope to compete in many more.

P29RB The three contacts made were the only stations heard for the hour but QRN was very bad. Disappointed that more contacts not made, but enjoyed contest and looking forward to next year.

ZL2AJB Always enjoy trans-Tasman contests. If our Memorial Contest ended at 2400h as in the past, instead of 0200h, would avoid a clash with the CW Sprint. Hopefully there will be more ZL activity.

VK5RV Appeared a good time had by all — a very friendly contest.

VK5KGS Once again a most enjoyable contest. As usual contacts harder to obtain near the end of the hour. Look forward to next year.

VK3CTK After several misadventures resurrecting a defunct second-hand transceiver and three days' operating experience, had great fun, worked up a sweat and intends to continue contesting.

VK6APK A great little contest but conditions in the West were atrocious this year. See you next year, same time, same contest.

VK3YH Great contest this year. A bit noisy, but lots more activity. A quick contest is a good contest. The Sprint is my favourite.

ZL1GQ Likes this activity very much, particularly the ease of putting in the log. Hopes there will be more ZL entries as contest gets better known.

(Contributed by David Box VK5OV, Australasian Sprints Contest Manager) **ar**

# HOW'S DX

STEPHEN PALL VK2PS
PO BOX 93 DURAL NSW 2158

This month's column came into being by the grace of God.

Mid-October, early in the morning, a painful QRM took grip of my lungs, and I felt that this was it — I am on my way on a beautiful skywave to the eternal DX in the sky. However, medical QRN and some weeks QRT in a Sydney hospital resulted in my continued presence on this earth. I am now home, slowly recuperating, and desperately trying to put my monthly column together before the 5 November deadline arrives. So, if it is a bit rough around the edges, or you miss some information that is usually part of this column, I hope you will understand . . .

## South Sandwich and South Georgia Islands DXpedition — VP8

The Middle East/Gulf situation is a problem; not only for the political powers but also for amateur DXpeditions. The eagerly awaited expedition to these islands has been postponed. Tony WA4JQS, the leader and organiser of the expedition, has stressed the word 'postponed'. It has not been cancelled. The Middle East situation has increased oil prices, which affected the charter fees of the ship, by pushing the cost of fuel up by an increase of $US40,000. All the equipment and supplies will be stored until the event takes place. So far, all expenditure was paid by the members of the DX team, and the cash donations are safe in a bank account.

## 'CQ' Worldwide Contests

These events took place on 27/28 October for the phone section, and on 24/25 November for the CW section. It is a very popular contest; one of "the" contests of the year in the amateur calendar. This is the time of the year when rare or exotic callsigns or countries are activated. KH0AM was operated by a number of Japanese operators. QSL to JE1CKA, PO Box 22, Mitaka, Tokyo 181, Japan. YM5KA from Turkey was operated by a group of Hungarian operators during the phone contact. Outside the contest, they used the callsign TA5KA. QSL cards for both callsigns go to HA0NNN, and not to the Turkish Bureau. ZD9Z was activated by N6TJ. QSL to W6CF. A number of OK amateurs were at the controls of 4U1ITU. QSL to OK3JW.

George W5YX activated V31YZ. QSL to home call. Martii OH2BH, the well known Finnish DXer, activated CT3BH. QSL to OH2BH. HC8A was also active. QSL to DX EX, PO Box DX, Cuenca, Ecuador, SA.

## Futuna Island — FW

It has been reported that FE1GJO is active from this island as FW1FM. He will be at that location for the next three years. His address is: Michel Feillet, Box 20, Sigave, Ile Futuna, Wallis et Futuna, via France.

## Mozambique — C9

The Colvins — Iris and Lloyd — left Malawi for Mozambique. In Malawi, in 16 days as 7P8KG, they made 7000 contacts with 155 countries. In Mozambique they are active as C9QL. QSL to YASME.

## Banaba Islands — T33

After the pioneer operation in May 1989 of Jim VK9NS as T33JS, which resulted in the acceptance of Banaba Island as a new DXCC country, some members of the 1990 Conway Reef DX team, such as Mats SM7PKK, Peter OH1RY, Sigi TF3CW and Kiyoko 5W1HM were active from this island between 6-20 November. The callsigns used were T33R AND T33T. QSL to OH3GZ, Jukka Kovanen, Varuskunta Rak, 47 AS 11, SF-11310, Riihimak, Finland.

## Malpelo Islands — HK0TU

Hopefully you have worked this rare DX country in the first week of November. It was a short five-days operation on CW, SSB, RTTY and satellite. Twenty Colombian amateurs comprised the DX team. QSL to Liga Colombina De Radioaficionados, PO Box 584, Bogota, Colombia, or via HK3DDD.

## Morocco — CN

In connection with the WW 'CQ' DX Contest, a number of French operators were very active from Morocco. CN2JO (F6ATQ), CN2LB (F1LBL), CN2MH (F6GKQ), CN2TT (F6IMS), CN2TU (F1NYQ) and CN2CW (F2CW). The contest station itself operated as CN0A and QSL for this particular callsign goes to the French DX Foundation, Box 88, F-35170, Bruz, France.

## St Paul Island — CY9

A number of French operators were active from this island at the end of October. The callsign used was CY9CF and QSL goes to FP5DX.

## Vanuatu — YJ8

Received from Rod YJ8RN the Vanuatu Independence Special Event Station YJ10IND QSL card. According to Rod, any valid VK call can get a visitor's callsign starting with the YJ0 prefix. Applications for a visitor's licence can be made by mail, prior to visit or on arrival, to:

Licensing Office, Radio Division, Telecom Vanitel, PO Box 146, Port Vila, Vanuatu, Attention Mr J Mael. Electricity supply in Vanuatu is 230V 50Hz. Standard three-pin plug outlet is used. Power limit is 100W CW and 200W PEP on SSB. Cost of licence is 500 VT or $A5.00. Unfortunately the proposed reciprocal agreement is not yet in operation between VK and YJ.

## Interesting QSOs and QSL Information

Note the following: callsign — name of operator — frequency in kHz _ mode — UTC — month of operation. ADAR meas QSL info in previous issue of 'AR'.

*** 5U7NU — Al — 14028 — CW — 2100 — Sept. QSL to F6FNU: ADAR.

*** VP5P — 14015 — CW — 2200 — Sept. QSL to WN5A Mr Jack T VanDemark Jr, 7514 Winterglen, Houston, TX, 77072 USA.

*** ZF2NE/ZF8 — 14018 — CW — 0430 — Qsl to W5ASP JA Staples, 10031 Meadowlake Ln, Houston, TX, 77042 USA.

*** ZP6XDW — 21026 — CW — 0430 — QSL via Bureau.

*** OX3EW — John — 14166 — SSB — 0750 — Sept. QSL to Box 1308, APO, New York, 09023, USA.

*** J6LMV — Tot — 28530 — SSB — 2206 — Oct. QSL direct only to Tot Henry, Box 1677, Castries, St Lucia, Windward Island, Caribbean.

*** V44KAY — Wayne — 21053 — CW — 1109 — Sept. QSL to Box 57, St Kitts, Caribbean.CP6AA — Gil — 21014 — CW — 1040 — Sept. QSL to Box 393, Santa Crus, Bolivia.4K4QQ — Nick — 21006 — CW — 0705 — Oct. QSL to home call RA1QQ. This station is on Bear Islands (Medvezhi Ostrova) 160°E-70°N.

*** 7P8EB — Rick — 21205 — SSB — 0508 — Oct. QSL to Box 1668, Maseru, Lesotho.

*** C21JM — Jim — 14226 — SSB — 1153 — Oct. QSL to Jim Motiti, Box 421, Republic of Nauru.

*** OM7EA — Harry — 14243 — SSB — 0623 — Oct. QSL via Bureau via OK3EA.

*** JT5AA — Eddy — 14226 — SSB — 1226 — Oct. QSL via Bureau.

*** VP8BXX — Paul — Sth Orkney — 14228 — SSB — 0710 — Oct. QSL to W9ARV Robett J Thibert, PO Box 730, Roscoe, Ill, 61073 USA.

*** A71AM Turos — 14243 — SSB — 0659 — Oct. QSL to DJ9ZB.

## RTTY News

*** Syd VK2SG reports increased activity on bands, especially on 21 and 28 MHz.

*** FW1FM — 14086 — 0705Z. QSL to Box 20, Futuna Island.

*** UG7GW — 14070 — 0525Z. QSL to Box 1, Erevan, 375038, Armenia, USSR.

*** 4U1UN — 14089 — 2045. QSL to N2K. ZS9J — 21085 — 1710Z. QSL to Leo Heinonen, 80 Sixth St, Parrhorst, 2193 South Africa.

*** UI9ABC — 14084 — 1300 Z. QSL to Box 40/1 Tashkent, 700040, Uzbek, USSR.

*** 3B9FR — 14082 — 1333 Z. QSL to Box 31, Rodrigues Island, Indian Ocean.

*** 8Q7DA — 14069 — 1600 Z. QSL to DL3RBE. PJ8JP — 14089 — 0036Z. QSL to AB1V.

*** ZL0AIC — 14090 — 0448 Z. QSL to HB9AAA.

*** 5Z4BI — 14082 — 1845Z. A41KB — 14074 — 0522Z. J39BS — 28091 — 1710 Z. QSL to WB2LCH. TF3KB — 28097 — 1816 Z. YI1BGD — 14070 — 0546 Z. V73AT — 14088 Z. QSL to K2CL.

## From Here and There and Everywhere

Les VK4DA reports that he heard but not worked P7U, who gave his name as Kim, and his QTH as Pyongyang, North Korea. He was operating CW on 21011 at 2030.

Austin VK5WO reports good contacts on 80m around 1100UTC. 7J1ADJ/JD1 on Minami Torishima and H44AP was worked in the 'DX Window'.

Derek VK3DD is eager to reach the magical 100 confirmed countries. In 10 months since getting his licence he has worked 143 countries and has 75 confirmed.

Frank VK2QL, despite his variable health condition, still tries to work a few DX on CW. Lately he worked TI75S (75 years scouting in Costa Rica) —

*** ZX8CW. QSL via PT7AA. 6W1QB on 28 MHz. QSL via DK3NP.

*** V73BL. QSL via WB4CSK. SV0HS Rhodes. QSL via DJ8MT. C30EOA. QSL via FD1DGC.

I appreciated a 'get well' card from Mary KB6CLL from San Francisco. Mary is the net controller of the 'early' '222' net.

The May 1990 Conway Reef DXpedition QSL cards 3D2AM have arrived in VK. Beautifully presented, they also give some interesting insight into the tribulations of a DXpedition. Conway Reef is 300 miles SE from Fiji — a small sandbar less than 400 feet long. The expedition's 66ft schooner "Galatea" lost her engine power and they had to rely on sails only. Later, en-route, the generator and the toilet were lost in the seas.

Conway Reef is infested with tiny ticks, which decided to nest on the operators, causing considerable discomfort. Despite the fact that they lost their cooking utensils, and two major storms wrecked their tents, they managed 45,000 QSOs. The expedition members were: Masa JG2BRI, Wayne N7NG, Pekka OH1RY, Martii OH2BH, Mats SM7PKK, Steve VE7CT and Dave VE7SV.

*** Romeo 3W3RR of Spratly fame is planning a short return trip to these islands for one week in December. However, he needs funds for food, water, equipment, generators, fuel and antennas to be transported to the islands. A total of $5000 is needed. Ed Kritsky NT2X is collecting the funds, which are refundable if the expedition cannot proceed. Send your contributions to: Box 300715, Brooklyn, NY, 11230, USA.

*** The Northern California DX Foundation has added 21150 and 28200 kHz to its Beacon Network which is still operating on 14100 kHz. The callsign is W6WX/b, and the beacon is located in Stanford, California. Reception reports to be sent to W6RQ.

The ARRL DX Advisory Committee (DXAC) is currently discussing the DX status of Yemen, Penguin Island, Germany and Jarvis island.

*** DA0FRG was a special event station celebration the reunification of Germany. QSL to DF4VS.

*** SARL (The South African Radio League) has announced the introduction of a novice licence, with ZU prefixes. The novices operate on 160, 80, 30, 15 and 10m bands. Maximum output is five watts CW and 20 watts PEP on SSB.

*** The DXAC has voted 16 to 0 not to recommend that Grosse-Ile (CI0GI) become a separate DXCC country.

*** Paul V47NXX and VP2EXX has a new QSL manager — KB2XR.

*** 9K2CS of Kuwait, operator of the first Yemeni DXpedition, is alive and well and living in Saudi Arabia. DL2BCH has spoken to him by telephone. The logs of the 70AA operation are also safe. 9K2DR and 9K2EC, the other operators, are also in safety. The status of Yemen, especially the status of that expedition, has not been resolved yet by the DXAC.

*** Lloyd and Iris Colvin made 7000 QSOs and worked 139 countries from Tanzania with the callsign 5H0QL.

*** If you worked an HF prefix (29 Sept to 7 Oct) then it was a blind operator from France with a special prefix.

*** VK7WRC was a special event station from the world rowing championships in Tasmania (27 Oct to 4 Nov).

*** The USA SSB sub-bands on 17 and 12m begin on 18110 KHz and 24930 KHz.

*** EL2CX has been evacuated from war-torn Liberia and is back in the USA as K3RV. EL2M lost his life in the fights.

## Interesting QSLs Received

Note: W=weeks; MO=months; FM=from; MGR=manager; OP=operator.

Direct QSLs received: YJ0IND (9W FM OP), YJ8RN (9W FM OP), 9J2BO (TW FM MGR), V51GB (5MO FM OP), FW/YJ8M (4M FM OP), YJ8NMB (4M FM OP), YJ8DX (4M FM OP), 8P6OV (3W FM OP) 3C1EA (2W FM OP), YK1AO (4MO FM OP), 3D2AM (4MO FM MGR), T30NAD (8MO via MGR via Bureau).

## Thanks to You . . .

As always, this column would not have been possible without the very much appreciated assistance of the following: VK2QL, VK2SG, VK2DID, VK3DD, VK4DA, VK4OH, VK4MWZ, VK5WO, VK6BA, KB6CLL, YJ8RN, "Break-In", "QRX DX", and "The DX Bulletin".

We also came to the end of our calendar year. The long, hot, windy bushfire danger days are ahead as we go into our normal Christmas break. I wish you safe motoring, plenty of DX, Merry Christmas and a happy and healthy New Year. **ar**

# POUNDING BRASS

GILBERT GRIFFITH VK3CQ
7 CHURCH ST, BRIGHT 3741

## Proposal for New Entry-Level Licence for Amateur Radio

As far as I can see, Australia leads the world in amateur radio licensing achievements with the current three grades giving different privileges at each level.

Rather than propose an easing of standards in an endeavour to increase numbers, I am proposing a new class of licence which is Morse only. In an effort to attract young, school-age people the corresponding requirements should require minimal theoretical knowledge but be tailored to encourage practical and theoretical learning as well as on-air operating expertise and incentives to upgrade, without compromising the present standards and yet establishing a base to upgrade them should the need arise.

In order to put forward a sound proposal to the WIA and DoTC I will need your help. But I hope to make your involvement as simple as a few minutes with a pen and a stamped envelope.

**Name:** CW/QRP Amateur Licence

**Requirements:**

Morse Code ..... 10 words per minute
Regulations ..... Current exam
Theory ..... Novice level CW only subjects
or ..... Examination equivalent to Year 10 maths and physics
or ..... Exemption for pass in maths and physics at Year 10 level
WIA membership .... Special rate

**Privileges:**

Access to all amateur HF bands on CW only.
Five watts maximum power with homebrew transmitter only
Callsign VK*.***M allocation
Automatic upgrade to full Novice privileges (ie SSB) on logging 1000 contacts over 12 months or more.

1. The reason for suggesting a level of 10wpm for the Morse code is that 5wpm is too slow to be of much use on air. I would envisage that the Novice code requirement should be brought up to the 10wpm level as well, with a recommendation to drop the sending tests. This way the full HF band privileges could be extended to both categories in CW only.

2. A homebrew limitation on transmitters is to encourage learning and experimentation at low cost to the student. There is no reason why the student cannot have help in building the equipment, but the idea is to get away from the *black-box* methods, as well as the temptation of voice and data modes at this level. Students can learn the benefits of low power, without the temptation of using the higher power of commercially built equipment.

3. The idea of an automatic upgrade to Novice SSB level is merely an encouragement. In this case, should a student build a transmitter (and perhaps receiver) and log 1000 contacts over a period of 12 months or more, they would have learned more than many a full-call operator. Logs could be submitted with references if necessary when applying for the upgrade.

4. Callsigns have been suggested with the inclusion of "M" after a normal three-letter call. We shall be seeing the need for four-letter callsigns in the future, so why not assign the M suffix now.

Before submitting this proposal to the Institute, I will need your comments and recommendations. A quick fill-in form is attached, but still write your comments if preferred. If you need the material on the other side perhaps you can photocopy the form.The proposals as they stand do not infringe on any present amateur rights, and even on 40 metres, five watts will not interfere with full-powered operations, but good operating practices will enable many more contacts to be made.

Results of the initial survey forms have been coming in, especially from the Westlakes ARC newsletter insert, and some preferences have been indicated already.

The name preferred is "CW/QRP Amateur Licence".

Ten wpm is the preferred speed.

Theory requirements were equal between Novice level (CW subjects only) and Year 10 maths and physics.

Regulations scored 10 to 1 for the current exam.

Votes were 8:3 for non-compulsory WIA membership.

Access to ALL HF amateur bands was preferred 4:1 over Novice segments.

There was a large majority which wants a maximum power of five watts.

Callsign suffix "M" was most popular.

Votes were 8:3 against the QRP club fees being paid by the WIA.

Auto upgrade to Novice was dead even.

For those of us who support this proposal, there is still a lot of work to do. WIA members have the advantage of the structure of the Institute to put the idea forward to other amateurs and to DoTC. However, this proposal is not an official WIA project, yet. If the WIA Executive is impressed by the number of members backing my proposal, it can ask for a vote from all members.

I hope that this offering can be a Christmas present to all the young people of Australia, and it can be yours, too.

Merry Christmas Morsiacs.

*Note: As Gil says, this is his own project and has not been considered by the WIA. Your responses MUST go to Gil, NOT to the WIA. Ed*

### Please circle your choice

| | | |
|---|---|---|
| Name: | | |
| CW/QRP Amateur Licence | yes | no |
| CW Novice Licence | yes | no |
| REQUIREMENTS: | | |
| Morse Code Receiving 10wpm | yes | no |
| Morse Code Sending 10wpm | yes | no |
| Another Speed Sending/Receiving | .....wpm | |
| THEORY | | |
| Same as Novice with CW only | yes | no |
| Easier than Novice CW only | yes | no |
| Maths & Physics Year 10 level | yes | no |
| REGULATIONS | | |
| Current Exam | yes | no |
| Easier (subject to DOC) | yes | no |
| WIA MEMBERSHIP | | |
| Compulsory | yes | no |
| Reduced Fee | yes | no |
| PRIVILEGES: | | |
| Access to all HF Amateur bands on CW only | yes | no |
| Access to Novice segments only on CW only | yes | no |
| Power level maximum 5 watts | yes | no |
| Other power level | ..... | |
| Callsign proposal with suffix "M" | yes | no |
| Callsign proposal with suffix "N" | yes | no |
| Auto-upgrade to Novice | yes | no |

YOUR CALLSIGN .....
NAME .....
COMMENTS: .....
.....
.....
.....
PLEASE POST TO GIL GRIFFITH VK3CQ, 7 CHURCH ST, BRIGHT VIC 3741

ar

**Prevent Pirates**
Make sure you sell your transmitter to a licensed amateur

# VHF/UHF AN EXPANDING WORLD

ERIC JAMIESON VK5LP
PO BOX 169 MENINGIE 5264

All times are UTC

## Beacons on Six Metres

| Freq | Callsign | Location | Grid square |
|---|---|---|---|
| 50.000 | GB3BUX | England | IO73 |
| 50.005 | H44HIR | Honiara | Qi00 |
| 50.005 | HL9TG | Korea | |
| 50.005 | ZS2SIX | South Africa | KF25 |
| 50.011 | JA2IGY | Japan | PM84 |
| 50.015 | SZ2DH | Greece | KM18 |
| 50.017 | JA6YBR | Japan | PM51 |
| 50.020 | GB3SIX | England | IO73 |
| 50.020 | CX1CCC | Uruguay | |
| 50.025 | 6Y5RC | Jamaica | FK17 |
| 50.025 | OH1VR | Finalnd | KP12 |
| 50.028 | JA7ZMA | Japan | QM07 |
| 50.029 | CT0WW | Portugal | IN61 |
| 50.032 | ZD8VHF | Ascension Island | II22 |
| 50.032 | ZS5SIX | South Africa | KG50 |
| 50.035 | ZB2VHF | Gibraltar | IM76 |
| 50.035 | ZS3VHF | South Africa | JG87 |
| 50.039 | FY7THF | French Guyana | GJ35 |
| 50.041 | FO5DR | Tahiti | |
| 50.045 | OX3VHF | Greenland | GP60 |
| 50.048 | TG4BFK | Guatemala | |
| 50.050 | GB3NHQ | England | IO91 |
| 50.050 | ZS6DN | South Africa | KG44 |
| 50.056 | VK8VF | Darwin | PH57 |
| 50.057 | TF3SIX | Iceland | HP94 |
| 50.062 | PY2AA | Brazil | GG66 |
| 50.064 | WD7Z | Arizona | EL59 |
| 50.065 | GJ4HXJ | England | IN89 |
| 50.065 | NB30/1 | Rhode Island | FN41 |
| 50.066 | VK6RPR | Perth | OF78 |
| 50.063 | KH6HI | Hawaii | BL01 |
| 50.075 | VS6SIX | Hong Kong | OL72 |
| 50.078 | TI2NA | Costa Rica | EK70 |
| 50.080 | KH6JJK | Hawaii | BL11 |
| 50.080 | HC8SIX | Galapagos Is | EI59 |
| 50.085 | 9H1SIX | Malta | JM75 |
| 50.086 | VP2MO | Montserrat | FK86 |
| 50.088 | VE1SIX | Canada | FN65 |
| 50.090 | KJ6BZ | Johnston Is | AK56 |
| 50.091 | 9L1US | Sierra Leone | |
| 50.092 | W5GTP | Louisiana USA | EM40 |
| 50.099 | KP4EKG | Puerto Rico | FK68 |
| 50.100 | HC2FG | Ecuador | FI07 |
| 50.100 | 5H1HK | Tanzania | |
| 50.110 | KG6DX | Guam | QK23 |
| 50.110 | A61XL | United Arab Emir | LL74 |
| 50.120 | 4S7EA | Sri Lanka | MJ97 |
| 50.321 | ZS5SIX | South Africa | KG50 |
| 50.490 | JG1ZGW | Tokyo | PM95 |
| 50.499 | 5B4CY | Cyprus | KM54 |
| 52.100 | ZK2SIX | Niue | AH50 |
| 52.200 | VK8VF | Darwin | PH57 |
| 52.310 | ZL3MHF | Christchurch | RE66 |
| 52.320 | VK6RTT | Wickham | OG89 |
| 52.325 | VK2RHV | Newcastle | QF57 |
| 52.330 | VK3RGG | Geelong | QF21 |
| 52.345 | VK4ABP | Longreach | QG26 |
| 52.370 | VK7RST | Hobart | QE37 |
| 52.420 | VK2RSY | Sydney | QF56 |
| 52.425 | VK2RGB | Gunnedah | QF59 |
| 52.435 | VK3RMV | Hamilton | QF12 |
| 52.440 | VK4RTL | Townsville | QH30 |
| 52.445 | VK4RIK | Cairns | QH23 |
| 52.450 | VK5VF | Mount Lofty | PF95 |
| 52.460 | VK6RPH | Perth | OF78 |
| 52.465 | VK6RTW | Albany | OF84 |
| 52.470 | VK7RNT | Launceston | QE38 |
| 52.485 | VK8RAS | Alice Springs | PG66 |
| 52.510 | ZL2MHF | Mount Climie | RE78 |

## Six Metres

Ron VK4BRG from Sarina has written with some information regarding contacts in his area during September and part of October.

11/9: 0754 KH6IAA; 12/9: 0851 NI6E/KH6; 13/9: 0809 KH6JJK, 1007 H1MAO/JD1 Ogasawara; 14/9: 0256 KH6IAA, 0851 HL1JV; 17/9: 0824 KH6IAA; 23/9: 0621 KH6JEB, 0805 KH6IAA; 25/9: 0754 KH6IAA, 1152 BZ4SAA; 26/9: 0241 and 0526 NI6E/KH6, 0654 KH6IAA, 2320 ZD8VHF, 2355 9L1US, both beacons copied until 0015; 27/9; 0740 KH6IAA, 2142 ZD8VHF beacon until 2320; 28/9 0305 ten W6 stations in San Diego and Los Angeles area closing 0421, 0735 AH6Q/MM near Japan, 0741 KH6JJK, 0915 BZ4SAA (Kang in Suzhou running 10 watts to a two-element yagi two metres high!) From the VK5LP viewpoint I was interested to read how casually Ron referred to his contact with BZ4SAA!

2/10: 0621 NI6E/KH6, 0622 NH6LT (QRP one Watt), 2147 ZD8VHF beacon until 2200; 3/10: 0646 KH6IAA; 5/10: 0601 KH6HI and two others, 2235 KG6DX, 2341 N6XQ; 6/10; 0106 9L1US CW two-way, 0107 9L1US SSB two-way, 0150 9L1US reported CU1UZ (Azores) was hearing and calling VK4BRG, 2245 9L1US beacon for over three hours, 2330 ZD8VHF beacon until 0220; 9/10: 2220 ZD8VHF beacon until 2230; 10/10: 0024 NI6E/KH6 until 0200.

Ron's most significant observation was the number of hours the 9L1 and ZD8 beacons were heard. On 12/10 Ron was very happy to work OA8ABT in Peru using what appeared to be a scatter path with both stations working via the direction of Hawaii. Another good contact came at 0102 on 14/10 when Ron worked KB6SL/CE3 in Chile, also ZK3KY on Tokelau Island.

On 19/10 Ron worked GJ4ICD on Jersey Island for a repeat contact. A phone call from Jersey to the UK resulted in four Gs being worked. His final contact of importance was to ZK3F on 26/10 when he and VK4s ZAA, ZAL, ZJB, ZNC, DDG, KU, KJL, DDC and other VK4s grabbed him around 0127 — in fact, John VK4ZJB relayed Kioka ZK3F on Tokelau Island back to me via the telephone! QSL is via JA1WHG. John said K6STI and K6GMY had been weak in Brisbane on 25 and 26/10.

Ron said 21/10 was a good day especially for the stations in the Townsville area with VK4FNQ and others working SM, DK, OZ, 9H and SV between 0800 and 0945. VK4VV also worked an IK6 in Italy. Stations there can work only between 50.150 and 50.162 and have a call frequency of 50.155. On the same day, Ron VK4BRG worked OZ7LO and Lyn VK4ALM worked SM7FJE. On 13/10 Lyn also worked ZK3KY.

Also on 8/10 there was an opening from JA8 to VK5 with JA8RC being worked here at 0355. The spread of the opening in Japan must have been very narrow as I noted only three JA stations operating, including a lone JA1. The same day at 0630 John VK4ZJB and Peter VK4APG worked AH3C from Johnson Island.

Dave 9L1US finally broke the barrier into Brisbane on 17/10 between 2330 and 2350, and was worked by VK4s ASV, ZJB, DDC, DDG, KJL, ZAA, ZAZ, ZNC and others to a total of about 15 stations. Lyn VK4ALM worked 9L1US at 0035. He sent 5x7 and received 5x5. During one QSO 9L1US discovered he had not switched on his linear, and was making the contacts using nine watts! (Thanks Geoff VK3AMK). It appeared the signal was coming in from across Canada. QSL is via WA8JOC.

On 19/10 there were some good signals into VK5 from VK4, at 0400 VK4FXZ was 5x9, 0437 VK4JS 579. At 0442 signals came in from JA0 and JA1 up to 5x9 and, at 0613, VK4ALM was heard working KH6KHP. At 0124 VK4ZJB worked KL7Y, then at 1112 HL1EIZ and at 1114 V73AT from Marshall Islands. K2CL is his QSL manager. The KH6HI beacon was heard in VK5 around 0600 as it was also the day before.

Hugh VK5BC said everything was relatively quiet at his QTH, with an occasional contact to JA, KH6 and VK4.

On 19/10 Peter VK8ZLX in Alice Springs caused a stir when his keyer was heard in several European countries. Between 0919 and 0926 he worked OH2TI, OH2HK and OH2BC, all in Finland. At 0952 he was also fortunate to score OZ8RW in Denmark for a new country. These contacts were almost 12 months to the day since the previous European contacts, but the hoped-for major opening into Europe for the next day did not eventuate. However, it was not unexpected that Peter, or someone placed on a similar latitude, should work Europe, as TV signals were evident from that direction during the afternoon. 21/10 produced a brief opening to KH6 from VK5, with KH6BC being worked by VK5RO. Geoff VK3AMK writes that JA1VOK recently reported the reception of European TV around 2230 via the long path, and also hearing the two-Watt Reunion Island beacon! Geoff confirmed that Chinese stations (BT,

BY, BZ etc) had been worked in Queensland and on 28/9, around 1340, VK1RX had worked VS6WV. On 29/9 Geoff had JAs from early afternoon until late at night with the new Japanese prefix being used by 7K1UBJ/3 and AH6Q/MM out from Yokohama causing some interest. Geoff was able to hear Steve VK3OT working BZ4SAA about 0830, and also a VS6 portable XX9 Macau, but these exotic signals not heard in Melbourne.

Apparently Peter VK1RX in Canberra often reports very strong TV in Canberra for long periods. When in Melbourne, it is either at very low level or inaudible. Peter has also been working into Melbourne on Sunday mornings using aircraft reflection. Signals usually peak very noticeably for several minutes at each QTH, but the path is critical and when he is in at one station he may not be audible at another. Peter is also able to copy the VK3AMK CW ident about 80 per cent of the time at varying strengths.

## Lord Howe Island

On Saturday 27 October, Doug Speedy VK9YQS flew to Lord Howe Island and proposes to operate on six metres for a period of six weeks. Although you may not read this until towards the end of his operating period, I am certain someone will work him before then and spread the news. His QSL manager is Steve VK3OT.

## Policy Announcement Six Metres Standings

Some years ago when I introduced the Six Metres Standings List in 'AR', it seemed like a good idea to know how well operators were going in assembling a list of countries worked and confirmed. Over the years, the list numbers have increased, especially with the excellent opportunities offered by Sunspot Cycle 22 in providing many worldwide contacts and to call areas probably never before believed possible. As a result, there have been some very high scores presented, and these scores are all the more remarkable because of the relative isolation of Australia in the southern hemisphere.

However, as the totals of worked countries continue to increase, the inevitable 'jockeying' for the top places will occur, as is already the case on the HF bands. In order to ensure all listings are accurate as possible, and in preparation for the day when it is inevitable the need will arise for me to relinquish the work for someone else to do, I propose that some new rules should be enacted following the publication of this notice.

(01/12/1990)

1. Amendments or additions to the published list in October 1990 'AR' will be accepted only upon receipt of a photocopy of the relevant QSL card.
2. Operators seeking to be listed for the first time to supply photocopies of all QSL cards, accompanied by a list of the cards set out in date order, with the earliest date heading the list, by 1 May 1991.
3. Operators presently listed are requested to please:
   (a) Supply me with a photocopy of all QSL cards relevant to their listing and showing details of the contact; or
   (b) Provide me with a dated, written declaration that two licensed WIA member amateurs have examined and approved of the applicants' QSLs and entries as set out on a new list, the list to be signed by all three people;
   (c) In parts (a) or (b) above the information to be supplied by 1 May 1991 to allow time for checking and preparation for publication in August 1991 'AR'. The February 1991 listing will be interim only, based on amendments to the October 1990 listing and received prior to 1 December 1990.

A number of amateurs have, in recent times, been sending me copies of their QSLs as they arrive. These need not be repeated when conforming to 3(a) above. Some years ago Graham VK8GB sent me, in book form, well-presented copies of all his QSL cards for his then 42 countries, so these need not be repeated. If you feel any explanation is required regarding a QSL card, then please send such notation.

If any amateur decides to opt out of the Listing due to the above provisions, I would accept his or her decision with regret. I know amateur radio is a hobby, a good hobby at that, and it will require some effort on the part of everyone involved but, hopefully, it will be seen in the light of tidying up our listings (if that is required) for viewing both here and overseas. I expect most of you keep your listed QSLs separate, anyway. Probably such measures should have been instituted right from the start, but, as they were not, let us start now without it being seen as a reflection on anyone. The final crunch will come when some fortunate amateurs reach 100 countries and apply for their ARRL DXCC Award, when the vetting of cards will be extremely strict, so we may as well get our house in order in readiness for that day! It may take until the next cycle, but that day will eventually come. Any costs in which you may be involved will still be small in comparison with the hundreds of dollars I spend annually on STD phone calls seeking information, and continuing postage costs, simply to keep the column going. I seek your co-operation and ongoing support.

## IPS Predictions

A brief message from John VK4ZJB says that the Ionospheric Prediction Service has indicated that the peak of Cycle 22 occurred during June/July 1989 with a smoothed mean average sunspot level of 156.1. The figures for Cycle 21 were 186. Cycle 22 was the fourth highest cycle. Based upon the above, we are certainly on the down-side of the cycle, but that does not mean we put away the six-metre gear. For the next two years at least, there should be bursts of exciting activity. It simply means that we will need to be more vigilant in being there when it happens, with the equinoxial periods probably still providing the best opportunities.

## Other News

Unfortunately, nothing has been reported on bands higher than six metres, but anything of significance will eventually trickle through.

I was sorry to read in the Geelong Amateur Radio Club newsletter that Arie VK3AMZ, during high winds, had recently lost his six-metre antenna system, consisting of four by five element yagis on his 75ft tower. Last reports indicate Arie has temporarily installed an eight-element yagi, and is giving thought to reinstalling something with greater gain. Good luck.

Much of the September/October issue of the bulletin of the West Australian VHF Group is devoted to very interesting extracts from an article by W5UN in the "2 Meter EME Primer" and outlines the requirements to enable contacts via the moon with special emphasis on those with less than elaborate stations. If interested, you could write to the VHF Group at PO Box 189, Applecross, WA, 6153.

## Closure

With this issue I commence the 22nd year of writing these notes. There have been a few difficulties during 1990 due to periods spent in hospital, but generally I have managed to keep in touch. Special thanks to the editor, his staff and all at 'AR'.

May I take this opportunity of wishing everyone the compliments of the season, and hope that it will be a happy time for all. As the Es season will soon be upon us, I hope all can share in the many contacts likely to be provided.

Closing with two thoughts for the month: "The trick is to hold opinions without letting opinions hold you" and "After the ship has sunk, everyone knows how it might have been saved".

**73 FROM THE VOICE BY THE LAKE**

ar

**Support the advertisers who support Amateur Radio Magazine**

# INTRUDER WATCH

GORDON LOVEDAY VK4KAL
FEDERAL INTRUDER WATCH CO-ORDINATOR
FREEPOST NO 4 AG LOVEDAY RUBYVALE 4702

Please Report any Illegal Operators in VK to your State DoTC

As the hot WX comes to us, more activity will be experienced on all our bands — also we will be subject to intruders within our own shores, if the reports I've had over the past month are any indication. I stress . . . these reports should be directed to the State DoTC office, giving ALL relevant info — send a tape as well if possible. The IARU Monitoring Service covers international intrusions to our legal bands, be they shared or not. In Region 3, 80m is not exclusive. RTTY and CW non-amateur signals CANNOT be considered intruders, BUT B/casters are. 40m: 7.1-7.3 is shared by international B/C stations only . . . non-amateur RTTY/CW are intruders. 30m: (10.1-10.15) is shared with fixed services. 20m: 14.00-14.25 is a primary allocation — 14.25-14.35 is shared. B/cast stations are intruders. 17m: 18.068-18.168 is shared. B/cast stations are intruders. 15m: 21.00-21.450 is a primary allocation. 12m: 24.89-24.99 is shared. B/cast stations are intruders. 10m: 28-29.7 is a primary allocation. ALL non-amateur signals are intruders. BUT don't waste time logging Asian CBers — we have no control over these intruders, nor has our DoTC which, like us, is aware of the problem. So, please don't waste our time with those loggings.

Have a happy and safe Christmas and New Year with good DX. 73, GORDON

**ar**

# EMC REPORT

HANS RUCKERT VK2AOU EMC REPORTER
25 BERRILLE RD
BEVERLY HILLS 2209

1) VCR and EMC: CQ-DL 6/1989 reported how an unshielded VCR was made immune to amateur radio radiation by placing the recorder in a metal case, when all other steps failed. Now CQ-DL 10/1990 reports that the Sanyo company submitted a VCR type VHR-5200G to the DL-EMC-reporter DJ1ZB, asking to check this model VCR for immunity. This model was a considerable improvement, and a ferrite choke at the inter-unit cable helped again at field strengths of 6V/m at 7MHz and at 15 V/m at 3.5MHz. The efforts and understanding of some manufacturers are greatly appreciated by all radio amateurs.

2) Channel S-6 Cable TV and EMC: CQ-DL 9/1990 reports the continuous argument between the German Post Office officials who granted the cable-TV companies the use of Channel S-6, which falls in the exclusive 144-148MHz radio amateur band. The responsible official claims that it is no serious problem, and where the cable signal interferes with amateur radio reception, or when 2m transmissions disturb TV reception, installation improvements can overcome the EMC problem. The DARC claims that the opinion of the officials is wishful thinking, that the post office and cable-TV firms have been warned early enough, and that they now do not admit they were wrong. The signal strength of the unwanted cable-TV signal was severely underestimated (DK3VW, DK9MD). Should cable-TV ever come to VK-land, we can be sure the same problem would arise: "Australia is not a different country!"

3) The Motor Car and EMC:

a) QST reported some time ago that a proud owner of a new Asian-made car observed severe electric malfunctions of his car when he was operating his mobile amateur radio transmitter. His complaint was answered by the dealer, who recommended "that the transmitter antenna should be shielded." This would certainly have solved the car's problems.

b) QST reported some time ago that General-Motors would like to hear from radio amateurs who are truck owners who may have experienced EMC problems. A sign of welcome co-operation.

c) The 'AR' February 1989, page 61 EMC Report (by VK6WQ) listed the many problems we start to experience now, and more so in the near future, as more and more 'electronics' is used in modern cars. Walter VK6WQ has now submitted a press release by Mercedes-Benz on the 'torture test' it introduced in co-operation with Siemens company, to study and solve any EMC problems which do or may arise. (See page 55) Cars are tested in a similar way to electronic appliances in the Jacky test-cell. It is good to see that some car manufacturers know where shielding and filtering may have to be applied so that car phones can be used.

d) Car Alarm and Static Electricity: A friend of mine triggered the car alarm when he left his parked car (local manufacture, new car). The spark caused by the friction electricity, when the driver's pants slid along the seat cloth, was picked up by the alarm wiring and so operated the alarm electronics. The dealer may recommend that driver and passengers have to wear conductive clothes to avoid false alarms.

**ar**

# EDUCATION NOTES

BRENDA EDMONDS VK3KT
FEDERAL EDUCATION CO-ORDINATOR
PO BOX 445 BLACKBURN 3130

I cannot decide whether I was serialised or censored last month. The editor assures me that it was entirely unintentional, and that it was all the fault of the printers, so I can only accept his apology, and I have to admit that the article was complete at the proofreading stage because I proofed it myself.

Whatever the cause, for those of you who felt that my November column had a somewhat unfinished feel to it, yes there were a couple of paragraphs missing, and so, in the best serial style, I say "Now read on".

The variations between candidate backgrounds and levels of experience are equally wide for both sexes. But one of the big things about amateur radio is its tradition of the experienced helping the newcomer, and most established amateurs are happy to continue this tradition. So, please, all you male amateurs, give the girls a go and a bit of encouragement whenever possible.

And girls, do not feel this is not your 'territory'. Ask questions, listen in, take an interest, and have a go for your licences (or two or three goes if necessary — many of the men had to make more than one attempt). The one time the two-metre box in the car saves you from a nasty experience on a trip or at night makes the whole effort worthwhile. Also, it is a hobby through which you can meet people whenever you feel like it, without having to get dressed up or even tidy the house.

Perhaps the current YLs and XYLs should present a slightly higher profile within both the hobby and the community. The ladies are poorly represented in Club or Divisional administrations, and rarely appear as contributors in this magazine. Whose fault, I wonder?

**73**

*Brenda Edmonds VK3KT, Federal Education Co-ordinator, WIA. Licensed for 30 years, and mother of two licensed YLs.* **ar**

# FTAC NEWS

JOHN MARTIN VK3ZJC
FTAC CHAIRMAN

## Data Base

Bah! I hate to confess that there are some Murphys in the listings published in the 1991 Call Book. Please note these corrections:

— The frequency of VK6RHF should read 29.680/29.580 MHz. This was a misprint on my part.

— The 146.975 repeater VK3RWQ should be VK3RSR, and its sponsor code should be VSA (Victorian Scout Association).

## Band Plan Revision

At its October meeting, Federal Council approved the band plan changes as last published in September 'AR'.*

## Records

Another microwave record has been verified this month, for a new Victorian 5650 MHz record: VK3ZBJ to VK4ZSH/3, a distance of 89.8 km.

In addition, the six-metre Digital modes record has reverted from VK3ZJC to its original holder, Steve Stephens VK4KHQ. The new record distance is 6392 km. **ar**

# SPOTLIGHT ON SWLING

ROBIN L HARWOOD VK7RH
52 CONNAUGHT CRES WEST LAUNCESTON 7250

The end of the first year of the '90s has arrived and it has been an eventful one, as far as shortwave has been. The one dominating event has been the Iraqi invasion of Kuwait on 3 August. This clearly demonstrated the effectiveness of international radio. Thousands of foreigners were stranded in Kuwait, and shortwave became the only means of reaching them with up-to-date news of the fast-changing developments. Special programming was hastily arranged to cater for those who became unwilling guests of the Iraqi Government. At deadline time, this crisis has not been resolved, dragging on with no signs of any imminent changes, although it could still easily erupt, as witnessed by the violent events elsewhere, particularly in Jerusalem and the West Bank.

The dramatic alteration to the geographical and political map in Europe was reflected as well by international broadcasters. Towards the end of 1989, revolutionary political change had snowballed across eastern Europe, profoundly affecting events within the USSR itself.

Radio Prague in Czechoslovakia went off the air for three weeks in April and, when it returned, there were new personnel and a new emphasis. The signal from the Czech station has also dropped, indicating they are now concentrating on European and North American audiences.

The East Germans have had the most interesting and turbulent year. It was apparent that many of the Radio Berlin International personnel did not share in the euphoria within the GDR towards reunification, especially when the West Germans made it plain that there were no jobs in the Deutsche Welle organisation for RBI staffers. The RBI publicly voiced its dissatisfaction at this arrangement, but to no avail. When reunification came, at precisely one second past midnight German time, the former RBI senders just switched their audio to DW in Cologne. RBI was no more.

As IARUMS co-ordinator for VK7, I have also noted that several intrusions in the WARC allocations, which were formerly located in the DDR, went QRT on or shortly after 3 October.

Another welcome trend has been the decision of many international broadcasting organisations to revert to two broadcasting periods, instead of four, as was the case. Many now make the change from summer to winter, at the end of March and September, which approximately coincide with the introduction of daylight saving in the northern and southern hemispheres.

Well, that is all for this month. Until next time, the very best of DX and 73.

**ar**

# ALARA

JENNY ADAMS VK3MDR
70 KANGAROO GROUND RD WATTLE GLEN 3096

Here it is at last. A little late perhaps, the official photograph of all who attended the ALARAMEET, held on the week end of 29/30 September.

The continuing saga of birds using antennas as perches, and another solution that comes from Ted VK3UI.

Subject: galahs, cockatoos and similar species that arrive at phased arrays and leave them in disarray!

Cure, which has been tested and proved successful, also with side benefits: washing stained with recycled mulberries, caravans and yard settings whitewashed by magpies etcetera no longer being experienced for over 12 months here, and longer down the south coast.

Secret solution: liberally smear <u>all</u> over the elements, radials, coax cable, strings, ropes or whatever you wish to save from being chewed, strained or broken when at least 44 galahs take to flight at the same time — Valvoline X-All Marine Grease or any other similar underwater lube used for outboard motors — any silicone grease should be okay. The one I used does NOT affect signals, nor does it deteriorate the coax. However, I don't know about the performance in dry duststorm areas if it rains AFTER an initial coating of dust — mine has some dust on it, but no problems have been experienced here to date — but I was suffering constant broken elements before, and no birds have landed on it since.

This particular antenna is a derivation of the ABQ tri-bander, with 3/4 inch dowel radials, and elements of hard drawn copper, mounted on hubs originally cast for cubical quads. The radials are, consequently, inclined above horizontal by 22° or so.

This year for JOTA I found myself in a very high ridge operating with my husband VK3JNI for the local Scout group. We weathered several electrical storms and each time disconnected our antennas. The Scouts didn't fully understand why until a spark was seen at the end of our 80m antenna. A very practical lesson.

From Joy VK2EBX: I was asked to give a talk to the local church Ladies' Guild about amateur radio, as they knew very little about the subject. I was somewhat surprised at the enthusiastic response, and spent as long answering questions as giving the talk. Quite an interesting morning.

As usual, went to Wellington to run JOTA from the local Scout hall. Although stormy in the morning (we couldn't have a JOTA with-

out storms, could we?) it cleared by lunchtime, and some good solid contacts were made, with most of the Scouts, cub Scouts and Venturers present having at least one opportunity to talk to their counterparts elsewhere. Most were quite enthusiastic, and enjoyed the experience.

SEASONS GREETINGS TO ALL
**73/33**
JENNY **VK3MDR**

Joy VK2EBX has been the hard-working columnist for ALARA for some years. All of us who are concerned with the production of AR would like to thank Joy for her literary efforts. We welcome Jenny VK3MDR, whose initial contribution appears in this issue

*ALARAMEET 29/30 Sept 1990, Dubbo, NSW.*
*Back row: Erica VK3AEB, Anne ZL2BOV, Pam VK3EYL, Pat VK4PT, Margaret VK3DML, Bev VK6DE, Anne VK4ANN, Marlene VK3WQ, Janet VK5NEI, Val VK4VR, Bev Tamblyn.*
*2nd row: Marilyn VK3DMS, Joy VK2EBX, Lyndell VK5KLO, Maria VK5BMT, Norma VK2DJO, Jenny VK5ANW.*
*Front row: Dorothy VK2DDB, Christine VK5CTY, Jenny VK3MDR, Meg VK5AOV, Nancy VK2NPG, Poppy VK6YF.* **ar**

# AMSAT AUSTRALIA

MAURIE HOOPER VK5EA
11 RICHLAND ROAD NEWTON SA 5074
PACKET: VK5EA@VK5WI

**National Co-ordinator**
Graham Ratcliff VK5AGR
**Packet Address:** VK5AGR@VK5WI
**Information Nets**
**AMSAT Australia**
**Control:** VK5AGR
**Amateur check in:** 0945 UTC
**Sunday Bulletin commences:** 1000 UTC
**Primary frequency:** 3.685 MHz
**Secondary frequency;** 7.064 MHz
(7.064 MHz is the frequency presently in use)
AMSAT SW Pacific 2200 UTC Saturday, 14.282 MHz

Participating stations and listeners are able to obtain basic orbital data including Keplerian elements from the AMSAT Australia net. This information is also included on some WIA Divisional Broadcasts.

## UoSAT-OSCAR-11 Bulletin 24 October 1990
## UoSAT Mission Control Centre

University of Surrey, Guildford, Surrey, GU2 5XH, England

Command Stations performed magnetorquing procedures near perigee or orbits on 15-17 October. The new transponder schedule is as follows:

| | |
|---|---|
| Mode-B: | MA 000 to 095 |
| Mode-JL: | MA 095 to 125 |
| Mode-LS: | MA 125 to 130 |
| Mode-S: | MA 130 to 135 |
| Mode-BS: | MA 135 to 140 |
| Mode-B: | MA 140 to 256 |
| Omnis: | MA 220 to 040 |

This schedule is expected to continue to 261290. The spacecraft attitude is: BLON = 180 and BLAT = 0

## AO-10

AMSAT-OSCAR-10 appears NOT TO have been receiving sufficient solar panel illumination to support Mode-B transponder operations. Both beacon and transponder signals show sign of FMing. Until further notice, please DO NOT use AO-10's transponder. AO-10 may be able to support Mode-B transponder operation in November.

## AO-16 PACSAT

The microsat BBS has been tested on the ground engineering unit, and is now ready for uploading to AO-16. The satellite BBS software was written by Jeff Ward, GO/K8KA, at UoSAT and was ported to the microsats by NK6K. The porting was easily achieved, as there are only 10 lines of code that are different between the UoSAT version and the Microsat version. A lot of effort went into the design of the BBS, operating system and other support code to make that possible. Once complete, the following elements will be available:

## 256k File System:

This is just half of one of the four available banks of bank-switched memory. The more complete file system using all four banks and the 6MB mass memory will be uploaded after more testing.

This implements the protocol described in the FTLO document, available on CIS, the 9th ARRL Networking Conference proceedings, and elsewhere. It allows file uploading, downloading and a simple directory display. It requires the use of software at the groundstation: a simple version, called 'PG' has been written by Jeff and will be on CIS soon.

## Broadcast server:

This implements the broadcast protocol as described along with FTLO and has been running for several weeks on UO-14, and a few people have rolled their own receive program, at least one written in Basic. A simple version, called 'KISSUI', has been written by Jeff and will be on CIS soon.

After this is loaded, the following separate programs will be running on AO-16:

Kernel — Operating system — NK6K/Quadron

AX25 — AX25 driver — NK6K/WB6YMH/Quadron, pd on a KA9Q AX25 implementation

PHT — Spacecraft control, power management and program loader — N4HY/NK6K

AARTDP — AART driver — NK6K/WB6YMH

MFILE — File system — GO/K8KA/UoSAT

FTLO — File upload/download — GO/K8KA/UoSAT

PBP — File broadcaster — GO/K8KA/UoSAT

## FO-20 Update

(from JARL FO-20 Control Team, 20 October 1990)

FO-20 has been in a period of no (solar) eclipse since the end of August. The temperature of its storage battery has continued to rise and has exceeded 35°C, the upper limit of safe operation.

We stopped routine operation and carried out tests on the operation of the transponder in each operating mode to check the different thermal equilibrium temperatures. The operation of the transmitter did not appear to have any effect on temperature. The battery temperature has a 'cycle time' of about 30 hours, probably due to the attitude variation of the satellite. The mean temperature is rising due to the changing distance between the earth and the sun.

The power generation of the solar cells is between 11 and 21 watts, or 17 watts average, which may allow parallel running of modes JA and JD. Consequently, both transponders were switched on late in October (20th). JD will be activated by a demand signal of uplink, as before.

In the event of power generation becoming less than 10 watts, mode JA will be turned off and, in any case, all transponder operation will be subject to switch off without notice in case of emergency.

## PACSAT Protocol Suite — An Overview

**Part 2 — continued from last issue**

### File Server

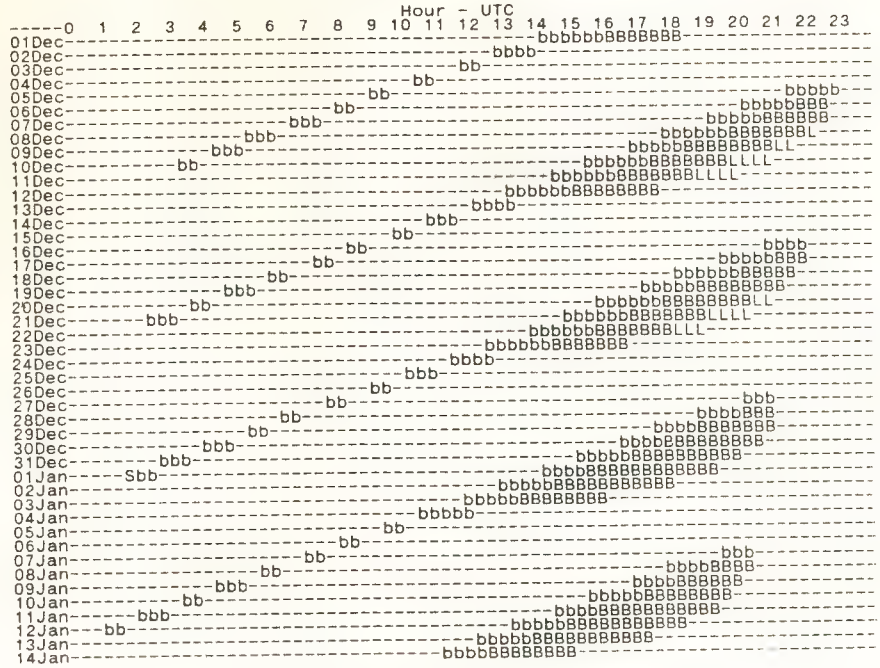
As a data transfer and storage device, a PACSAT can serve a multitude of purposes. It can store telemetry, digitised voice and video images, personal mail, forwarded mail, or anything else that can be stored in a computer file. Mail forwarding is a good example of an excellent use of a PACSAT. AO-16's 1200 baud link could easily be used to transfer 240k bytes of uncompressed forwarded mail in each direction between California and England in 24 hours, with just one morning and evening pass over each location. UO-14's 9600 baud link could move 1.6Mb of data in the same time. A PACSAT can store up to 8Mb of data. This would make a powerful addition to the current HF relay network.

The problem, however, is that the current amateur network is in a state of flux. New addressing schemes are proposed every few weeks, new routes and new ways of routing are proposed, tried, discarded or modified. This is good. Implementing the software on a spacecraft to follow these shifting designs is difficult, however. The testing required for the spacecraft is more rigorous, especially on the Microsats, where the same computer is used for the BBS and to keep the batteries charged. Faulty forwarding code could crash the computer, which could cause damage to the batteries or reduce their life expectancy.

The amount of program memory is limited on the spacecraft as well. To counter the effects of high-energy particles above the earth's atmosphere which cause memory bits to be changed, the PACSATs use 12 bits to store eight bits of program data. The extra

## OSCAR-13 Schedule for 01Dec90 to 14Jan91

### Station: Adelaide




AO-13 Schedules

| | 01Dec90 to 26Dec90 | 26Dec90 to 27Mar91 |
|---|---|---|
| Mode-B | : MA 000 to MA 095 | MA 000 to MA 165 |
| Mode-JL | : MA 095 to MA 125 | MA 165 to MA 190 |
| Mode-LS | : MA 125 to MA 130 | MA 190 to MA 195 |
| Mode-S | : MA 130 to MA 135 | MA 195 to MA 200 |
| Mode-BS | : MA 135 to MA 140 | MA 200 to MA 205 |
| Mode-B | : MA 140 to MA 256 | MA 205 to MA 256 |
| Omnis | : MA 220 to MA 040 | MA 240 to MA 030 |

## NASA 2-Line Keplerian Elements – 26 Oct 90

```
AO-10
1 14129U 83 58  B 90291.49673605  .00000016  00000-0  0000000 0  5545
2 14129  26.0935 179.3309 5954892 185.1631 164.1748  2.05879926 55248
UO-11
1 14781U 84 21  B 90297.12260385  .00002090  00000-0  39125-3 0  8027
2 14781  97.9370 345.3899 0011964 195.3256 164.7611 14.65804274354853
MIR
1 16609U 86 17  A 90296.69113258  .00040228  00000-0  51186-3 0    97
2 16609  51.6115  43.0151 0032664 172.2722 187.8428 15.58301653268170
RS-10/11
1 18129U 87 54  A 90296.94697757  .00000009  00000-0  35157-5 0  3613
2 18129  82.9261 233.3816 0013152 119.0245 241.2209 13.72118295167105
AO-13
1 19216U 88 51  B 90285.55558503 -.00000132  00000-0  99999-4 0  1506
2 19216  56.9677 131.3556 7041877 237.6838  35.4920  2.09702865 17837
UO-14
1 20437U 90  5  B 90297.24882574  .00000676  00000-0  28451-3 0  2183
2 20437  98.6913  12.9248 0010938 133.4532 226.7591 14.28762279 39295
UO-15
1 20438U 90  5  C 90293.23483277 .00000504   00000-0  21707-3 0  1283
2 20438  98.6928   8.8830 0010485 145.0366 215.1506 14.28459268 38719
AO-16
1 20439U 90  5  D 90295.40866860  .00000686  00000-0  28772-3 0  1187
2 20439  98.6962  11.2732 0012174 140.2587 219.9521 14.28860107 39039
DO-17
1 20440U 90  5  E 90295.96053991  .00000770  00000-0  32049-3 0  1291
2 20440  98.6959  11.8428 0012368 138.6657 221.5478 14.28915980 39118
WO-18
1 20441U 90  5  F 90296.64163114  .00000673 .00000-0  28191-3 0  1214
2 20441  98.6960  12.5553 0012965 137.3260 222.8933 14.29001556 39214
LO-19
1 20442U 90  5  G 90297.11848910  .00000788  00000-0  32645-3 0  1252
2 20442  98.6941  13.0586 0013215 135.5831 224.6414 14.29074150 39280
FO-20
1 20480U 90 13  B 90296.97855528  .00000077  00000-0  22052-3 0  1082
2 20480  99.0259 319.1034 0541648 116.8206 248.9305 12.83151877 33261
```

## SATELLITE ACTIVITY FOR JULY/AUGUST 1990

**1. Launches**

The following launching announcements have been received:

| Int'l No 1990- | Satellite | Date | Nation | Period min | Apg km | Prg km | Inc deg |
|---|---|---|---|---|---|---|---|
| 063A | TDF-2 | Jul 24 | France | 891.0 | 35837 | 12749 | 1.4 |
| 036B | DFS-2 | Jul 24 | Germany | 1437.8 | 35853 | 35786 | 0.1 |
| 064A | COSMOS 2087 | Jul 25 | USSR | 709.0 | 39342 | 613 | 62.8 |
| 065A | CRRES | Jul 25 | USA | 591.9 | 33612 | 335 | 18.2 |
| 066A | COSMOS 2088 | Jul 30 | USSR | 116.0 | 1537 | 1502 | 73.6 |
| 067A | SOYUZ TM-10 | Aug 01 | USSR | | | | |
| 068A | USA-63 | Aug 02 | USA | 722.7 | 20665 | 19931 | 54.7 |
| 069A | COSMOS 2089 | Aug 03 | USSR | 89.9 | 357 | 186 | 62.8 |
| 070A to | COSMOS 2090 | | | | | | |
| 070F | COSMOS 2095 | Aug 08 | USSR | 113.8 | 1432 | 1390 | 82.6 |
| 071A | MOLNIYA 1-78 | Aug 10 | USSR | 736.0 | 40634 | 646 | 62.7 |
| 072A | PROGRESS M-4 | Aug 15 | USSR | 88.5 | 235 | 186 | 51.6 |
| 073A | RESURS-F 8 | Aug 16 | USSR | 88.5 | 229 | 176 | 82.3 |
| 074A | BSB-R 2 | Aug 18 | UK | 1432.2 | 35859 | 35565 | 0.3 |
| 075A | COSMOS 2096 | Aug 23 | USSR | | | | |

**2. Returns**

During the period 48 objects decayed, including the following satellites:

| | | |
|---|---|---|
| 1963-022A | TRANSIT 5A3 | Aug 03 |
| 1990014A | SOYUZ TM-9 | Aug 09 |
| 1990-060A | RESURS-F 7 | Aug 16 |
| 1990-062A | COSMOS 2086 | Aug 03 |

3. Notes

1990-067A SOYUZ TM-10
With two astronauts aboard, docked with orbital station MIR on 3 August 1990

1990-072A PROGRESS M-4 Docked with space station MIR on August 17 1990.

1990-014A SOYUZ TM-9
The landing module, with two astronauts aboard, touched down at a preset area 72km north-east of the city of Arkalyk, USSR, on 9 August 1990.

**Bob Arnold, VK3ZBB**

**ar**

bits are used to correct for single bit errors. To keep the cost down, and to reduce the power used (AO-16's CPU uses about 500 milliwatts on average), only 256k bytes of program space is available. (This should not be confused with the message storage space, which is much larger than the program memory, and is protected with a software algorithm using three bytes to protect 253 bytes of data. Because this memory is protected with software, it is not suitable for storing a running program, since a program cannot protect its executing instruction).

We have a desire, then, to keep the spacecraft code simple and stable, while still allowing it to be a useful part of the changing amateur network.

We propose that the spacecraft be primarily used as a file server, moving data files from one point to another. The PACSAT would have no knowledge of the contents of the files, nor would it take an active role in the forwarding of mail messages. Groundbased software could, however, make the PACSAT system look like a familiar BBS to the user, and it could intelligently forward mail.

A PACSAT will know how to receive and transmit a standard file format. All files will have a standard header, the same one that is used by the broadcast protocol. It will also know how to select files for transmission based on the contents of the header. This feature can then be used by groundstation software to emulate any desired user interface.

For example, assume that a user wanted to send a personal mail message to a friend. In the current terrestrial environment, he would connect to a BBS, which would lead him in a question and answer session something like this:

Remote Computer User

| | |
|---|---|
| What do you want? | Send message |
| To whom? | Fred |
| Title? | Club meeting |
| Message? | Meeting at 8pm |
| What do you want? | Read new mail |
| Message #200 | |

. . . .

Using the PACSAT system, exactly the same exchange would take place, except that the conversation is between the user and his local computer. The message is stored for later transmission to a PACSAT. The read new mail request is also stored. The next time the PACSAT comes overhead, the computer does the following:

1) builds a file with a standard PACSAT header. The header says that the file contains a mail message, from you, to Fred;

2) the file is compressed and sent to PACSAT;

3) the local computer then sends a message to PACSAT that says, "Send the next file whose header meets the following criteria: it's a mail message type, the destination is me, and the file number is bigger than "x"."

"x" is the number of the last file received on the ground, and is kept by the local computer. After the pass, the local computer can now print any new mail received. To the user, it looked pretty much the same.

What about file forwarding? A gateway would need to know what type of mail it could forward. Let's assume that the routing scheme of the week is based on a hierarchical string containing states, like nk6k.ca.usa, and this gateway handles mail to CA, NV and OR. The gateway would send a message to PACSAT containing the following request:

"Send the next file whose header meets the following criteria: it's a forwarded message, and the destination string contains '?.ca.?' or '?.nv.?' or '?.or.?', and the download count is 0."

The file would be received, decompressed and imported into the standard BBS program after the pass.

In this way, the ground program can be as simple or as complex as required, the PACSAT only needs to know how to select a file for transmission based on the contents of fields in the standard file header.

## Summary

These two ideas, broadcasting and file server, are certainly different than the current common usage of packet radio on the amateur bands. We feel that this is the best approach for the special case of a PACSAT, however, and that with suitable groundstation software, these concepts can be integrated into the mainstream.

## Implementation Status

Prototype implementations of all of the protocols discussed in this group of papers are running on UO-14 as of late July, they should be running on the Microsats by the time of the ARRL conference. Prototype ground software is also running. We plan to make the source code for simple versions of the ground portion of the system available ASAP. Executable versions for the IBM PC will be made available as shareware, with the proceeds going to AMSAT-UK and AMSAT-NA to further development of future PACSATs. Fully integrated, automated, colour graphic, "all singing and dancing" software will be available for sale by AMSAT-UK and AMSAT-NA later in the year. Like QUICKTRAK and InstantTrak, the proceeds from this commercial quality software will go to finance future amateur satellite endeavours.

We hope that other software authors will use the documentation and source to develop support for non-IBM PC systems. The contents of these papers are sufficient to allow programmers to begin implementing their own software now.

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73s from Maurie VK5EA **ar**

# DIVISIONAL NOTES

## VK2 NOTES

TIM MILLS VK2ZTM

### 1991 Fees

VK2 members are advised that the fee applying to new and renewing members from 1 January 1991 has been set at Full and Associate $65; Student and Concession $52; and Family and Non AR at $38. Details about the fee make-up is covered in the WIANEWS columns at the front of this issue.

If you have a friend who is thinking about joining, have them contact the Divisional office early this month for an application, or make use of the reverse of your mailing label.

### Divisional Office

A reminder that the office will be closed for a period during the Christmas break. The exact time will be conveyed on the VK2WI broadcasts. Contact with the Division may be made by mail to PO Box 1066, Parramatta NSW 2124, phone (02) 689 2417, with answering machine. Calls taken 12 noon to 1pm, Monday to Friday and 7-9pm Wednesday. Fax (02) 633 1525, 24-hour service. Personal visits to 109 Wigram Street, Parramatta, 11am-2pm Monday to Friday and Wednesday night.

Looking for a gift for Christmas or you need to leave a hint? Check out the Divisional Bookshop. Leave 'AR' open on your desk at this page.

### QSL Bureau

For some reason the VK2 call region, while having about one-third of the Australian callsign population, handles something like two-thirds of Australian QSL cards. This is about 300,000 cards and is still increasing. This is a massive workload and the Division is at the moment planning a different style of Bureau — this will take time, and you are asked to keep in touch with Divisional broadcasts while this is developing.

### Broadcasts

The last full broadcast for the year will be on Sunday 16 December. The first for next year is scheduled for 13 January. There will be a pre-recorded transmission of technical material on some of the Sundays between the above dates.

### Call Book

Copies of the 1991 Call Book are still available from the office, $9.50 to Members; $11.00 for non-members. Add $2.10 to cover postage. Several clubs obtained bulk stocks, so check with yours for a copy. Advise the Divisional office of any errors or changes. Would repeater groups advise of any changes needed to their listings in the data section, to update the data section in February 'AR'. Do this prior to Christmas. Remember the Divisional Bookshop has a wide selection.

### WICEN (NSW) Inc

Now a fully accredited Statewide VRA Squad, it recently received a $4000 grant from the State Government. Most other VRA squads also received various amounts. During the past few months, most radio clubs in the State received a WICEN information package. Check with your club secretary if you would like a copy of the material. Postal address for WICEN (NSW) Inc is PO Box 123, St Leonards NSW 2065.

### New Members

The following became Members of the NSW Division during October. A warm welcome is extended to them.

| | | |
|---|---|---|
| D J Ashley | VK2XQN | Wagga Wagga |
| C Bellenger | VK2MIB | Milperra |
| S J Bloxham | VK2NPC | Riverwood |
| AJ Bowman | VK2ASB | Wentworth Falls |
| G E Budden | VK2DJR | Lillian Rock |
| W K Chung | VK2WWW | Gilgandra |
| J Farkas | VK2BFA | Mudgee |
| G Foster | Assoc | Dudley |
| A R Gamble | Assoc | Gerringong |
| R J Hardimon | VK2ZZK | Lethbridge Park |
| D J Kent | VK2BJI | Parkes |
| S A Kitchener | Assoc | Fairfield |
| C E Lambart | Assoc | Sans Souci |
| D K McEachern | VK2KOP | Rosemeadow |
| S J Mercer | Assoc | Castle Hill |
| J C Nicholas | G3HBH | Greenfield Park |
| P D Owen | Assoc | Woolloomooloo |
| S A Russ | VK2USR | Homebush |
| M Suzuki | VK2GHE | Davidson |

On behalf of Divisional Council may I wish all Members and our various workers a Merry Christmas and a Happy New Year.

**73 TIM VK2ZTM**

**ar**


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FAX: (054) 92 2666

## VK3 NOTES

JIM LINTON VK3PC

### Christmas-New Year Holiday Break

Firstly, may I, on behalf of the WIA Victorian Division Council, wish all members Seasons Greetings and hope 1991 is a good year for them and their families.

During the Christmas-New Year holiday period both the weekly VK3BWI broadcast and the office in Ashburton will take a break. The last broadcast for the year will be Sunday 16 December, and will resume on 3 February 1991. The Broadcast Officer, Bill Trigg VK3JTW, and his team, have consistently produced a good standard broadcast that has won praise from throughout Victoria and interstate. They have earned a rest.

The WIA Victoria office will cease trading at the close of business on Tuesday 18 December, and will reopen on Thursday 7 February 1991.

### TVI Filter Kit

The kit of TVI filters available on personal loan as a membership service has helped borrowers quickly demonstrate to their neighbours how easily TVI problems can be cured.

Two sets of kits of various types of filters made by Jenlex Pty Ltd can be borrowed for 14 days by prior arrangement with the manager/secretary Barry Wilton VK3XV. A deposit is required, which will be fully refunded when a borrowed filter kit is returned. The kits can be borrowed in person only and are not available through mail order.

WIA Victoria and Jenlex Pty Ltd are working on a special cavity notch filter designed to counter interference experienced on the two-metre band from paging services. The closest paging frequency is 148.050MHz. A cavity notch filter under trial is designed to allow operation on the top end of our band without suffering from paging interference, particularly on the packet frequency of 147.600MHz.

### Uncollected QSL Cards a Problem

The WIA Victoria Inwards QSL Bureau, at its last despatch to distribution points, sent some 20,000 cards but, unfortunately, some of them will never reached their intended recipient.

The reason? The holders of callsigns who have nominated a distribution point are too lazy to make arrangements to collect their cards.

If registered with the Bureau, it would be wise to check with your nominated distribution point this month and collect your cards — if there are any.

The Bureau and distribution points can only be expected to hold unclaimed cards for a period of three months. After that they can be treated as dead cards and destroyed.

### Examination Service Expands

WIA Victoria examinations continued to expand with the addition of two new centres in New South Wales at Gosford and Orange joining for the first time last month. The supervising clubs were the Central Coast Amateur Radio Club and the Orange Amateur Radio Club.

Those centres are in addition to Amateur Radio House, Parramatta, supervised by the WIA NSW Division, which joined Australia's largest examination service in August. The examinations were also held at a dozen other centres throughout Victoria and at Albury by the WIA Victoria affiliated Twin Cities Radio Club.

### Call Book Available

Copies of the 1991 Australian Radio Amateur Call Book are in stock at the Divisional Bookshop and can be obtained in person during office hours, or via mail order. The over-the-counter price is $9.50 a copy, or add $1.50 for post and package, making the mail order price $11 to members.

Several WIA Victoria member clubs have also placed bulk orders with the Division and will sell the Call Book at club meetings. **ar**

## VK6 NOTES

JOHN HOWLETT VK6ATA

### WAADCA

At their recent AGM, members of the Western Australian Amateur Digital Communication Association, Inc voted the following members to lead the group:

| | | |
|---|---|---|
| President | Cliff | VK6LZ |
| Vice President | John | VK6KRN |
| Treasurer | Bruce | VK6ABR |
| Secretary | Thrish | VK6QL |
| Broadcast | Christine | VK6ZLZ |
| Equipment | Chris | VK6KCH |
| Repeater Tech | Joe | VK6ZTN |

Digital Communications is not a thing of the future, but is here today. It represents a different and interesting way to pass messages and collect information. Contact Cliff or one of the group for more information.

### Equipment Bank

The bank has a selection of mainly test equipment and includes RF and AF generators, DIP meter, power meter and frequency counter. Some service manuals and reference books will be added in the future. Financial members of the WIA can borrow equipment by presenting the flier from the latest copy of 'AR' as proof of membership. The bank is located at the Northern Corridor Radio Group, at Carine College, Carine (where Hamfest is held). Call Sunday mornings between 0930 and 1030 or at club meetings, held on the second and fourth Tuesday evenings at 1900 on.

### Lecture

The subject of October lecture was how to use packet radio. The display from a laptop computer was projected onto a large screen and gave everyone present an excellent demonstration of how to operate packet, which button to push and what the screen should look like afterwards. This was one of the many well-presented lectures seen by members this year and has become a popular feature of meetings. Listen to Sunday Broadcast for details of future lectures and make full use of your membership.

### Hamfest

This event seems to have established itself as an annual fixture with many businesses already asking for the same spot next year. A full story of the date is being prepared and will be presented to this magazine for consideration in the new year. If you attended and would like to offer some feedback, it will be appreciated. Jot down your likes and dislikes on paper and send to NCRG, PO Box 244, North Beach 6020.

### HARG

Hills Group members once again attended the Kalamunda Festival and put on a display of radio activity. The group also has a permanent display in the local library promoting the hobby. With the festive season just a couple of weeks away, your president and council wish all readers a safe and merry Christmas. **ar**

## 5/8 WAVE

JENNIFER WARRINGTON VK5ANW

### Westfield Displays

It has been suggested that perhaps this would be a great 'club' activity. In fact, Adelaide Hills ARS will probably take on the Marion display. If your club is interested, please tell John McKellar VK5BJM. If you don't belong to a club but would like to be involved, you will still be welcomed with open arms. (The venues are Arndale, Marion and TTP, in late January).

### Old Timers' Lunch

Once again a most successful luncheon was held at the Marion Hotel on Tuesday 30 October. Despite various 'ills', the committee of George Luxon VK5RX, Ray Deane VK5RK, John Allan VK5UL and Max Farmer VK5GF did their usual fine job of organising the event. Bottles of wine were won by the following:

Margaret Butler XYL of Lloyd VK5BR
Eric Hauber VK5EZ
Nobby Prince VK5WK
Col Moore VK5RO.

If you would like to join us next year, do let a member of the committee know. It is not by 'invitation only' but if you aren't on their mailing list, the committee won't know you are interested.

## Positions Vacant

Sometime between December '86 and April '87, Kevin May VK5IV volunteered to take over as broadcast producer and, having done an excellent job since that time, has decided that it is time to move on. So we are looking for a volunteer to produce the broadcast. I'm told it takes a couple of hours each week, but is a very rewarding experience. Kevin and others will be only too happy to help you initially and act as back-up. If you'd like to give it a try, contact Kevin or a member of the council.

While we are talking of broadcasts, Chris Whitehorn VK5PN is still desperately in need of volunteers to relay the Sunday morning broadcasts. Please contact Chris if you can help.

## Diary Dates

Tuesday 4 December Christmas Social, 8pm, Woodville Community Hall, 64c Woodville Rd, Woodville (between Port Road and the town hall). Speaker — Keith Rendell (who, I'm told is a very entertaining after-dinner speaker). Bring your partner and a plate of supper.

As this is the last column before Christmas, I'd like to wish you all a very happy and safe holiday season.

**ar**

# WICEN

IAN MARSH VK3PLL

## Forthcoming Events

Communicating is one of WICEN's specialist tasks, and WICEN needs to keep its members, as well as members of the amateur fraternity at large, informed of its activities. December sees WICEN's biggest events, in terms of operators involved and the duration of the event. These are The Murray River Canoe Marathon, Great Victorian Bike Ride and the West Coast Bike Ride.

WICEN appreciates the problems of those amateurs not involved in the event having their usual call frequency or 'sked' interrupted by a stream of messages. To run an exercise, we MUST notify DoTC of the time, date, place, duration and FREQUENCY of the operation at least three weeks in advance. if you need to use the frequency, just ask the controlling station (usually VK3AWI) if you can call a friend and then, if possible QSY, but if not, then exchange any appropriate information, leaving sufficient gaps to enable any emergency break-ins.

The Red Cross Murray River Ultra Marathon starts at Yarrawonga on 27 December and finishes at Swan Hill on 31 December. The hours of operation are generally between 6.30am and 7.30pm. The main frequencies to be used are 3.600 MHz, 146.500 MHz, and some traffic on 147.300 MHz and 160 metres.

Operators for this event are needed for either one or more days, and it is open to operators from any State — we regularly have at least a couple of people from either NSW or SA. For further information, contact Ian Marsh VK3PLL on (03) 802 8593 or at 51 Doynton Pde, Mt Waverley, Victoria, 3149.

The Great Victorian Bike Ride commences in Bairnsdale on 1 December, and concludes in Melbourne on 9 December. The main frequencies will be 3.600 MHz and the two-metre repeaters VK3, REG, RLV, RSG, RWP (WICENportable) RMM, RML and UHF VK3RGW Mt Carrajung.

The West Coast Bike Ride runs between Portland on 1 December and Melbourne 9 December. The main frequencies being 3.600 MHz and the two-metre repeaters VK3 RWZ, 3RGL, 3RWL, 3ROW and 3RMM. **ar**

# QSLs FROM THE WIA COLLECTION (28)

KEN MATCHETT VK3TL HON CURATOR WIA QSL COLLECTION
PO BOX 1 SEVILLE VIC 3139

## Bahrein — Middle East Emirate — Part 2

### MP4BEE

The MP4 prefix came into use in 1949. As pointed out in some earlier articles on "QSLs of the WIA Collection", the allocation of the prefixes commencing with the letter M was not an official one by the ITU. These prefixes were used by military occupation forces in several Middle-East countries. (See 'AR' Dec 1989, Jan 1990, June 1990). The QSL shown here, MP4BBE, was for a QSO on 40m CW with well-known DXer, Ivor VK3XB. The Bahrein operator, John St Leger, was an employee of BAPCO (Bahrein Petroleum Co Ltd) at Awali, an inland town on Bahrein Island.

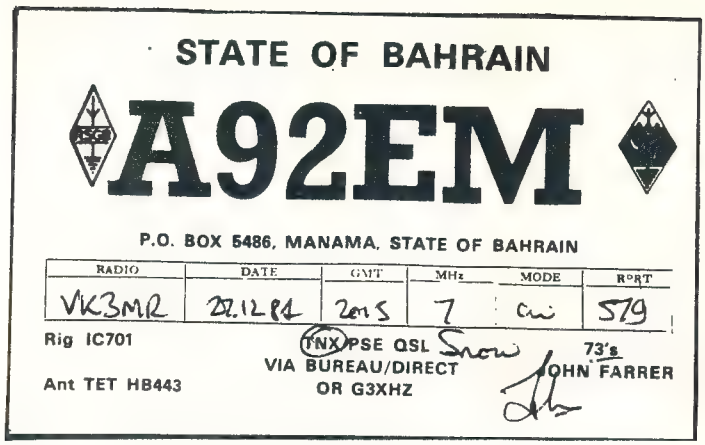
The attractive QSL in the desert colours of red and gold shows an oil well in addition to a tropical palm. In fact, before the discovery of petroleum in 1971 (which made Bahrein a country with one of the richest per capita incomes in the world), the country was suffering severely from a downturn in its pearling industry due to the Japanese development of the artificial pearl. Bahrein became the first Middle-East country to build an oil refinery. A particularly active amateur in the early 1960s was Ian Cable MP4BBW (later A9XBW), Chairman of the Amateur Radio Association of Bahrein and QSL Manager. Like many other VKs of the late 1950s and early 1960s, the writer has to thank Ian for the initial QSO and confirmation with that country.

The discovery of petroleum changed the whole nature of the country. Desert areas gave way to six-lane highways — together with suburban sprawl. Bahreinis have adopted many Western customs, but in some way manage to maintain an Eastern culture, due no doubt to their religious beliefs. Many of the inhabitants wear traditional white robes, and women the abbaya (black cloth covering the whole body), but some do wear Western dress. Tourist information advises foreigners not to wear scanty dress in public. The climate is oppressive and humid, and the fact that the country is so isolated commands high salaries for expatriates. Side by side with Arab dhows, power boating can be seen. Camel and horse racing are other recreational activities.

During the 1960s, DXCC lists showed Bahrein's prefix as MP4B (cf MP4T = Trucial Oman, MP4Q = Qatar, MP4M = Muscat) and it was while this prefix was being used that the country became independent on 15 August 1971 as the State of Bahrein. (British forces had withdrawn during 1968).

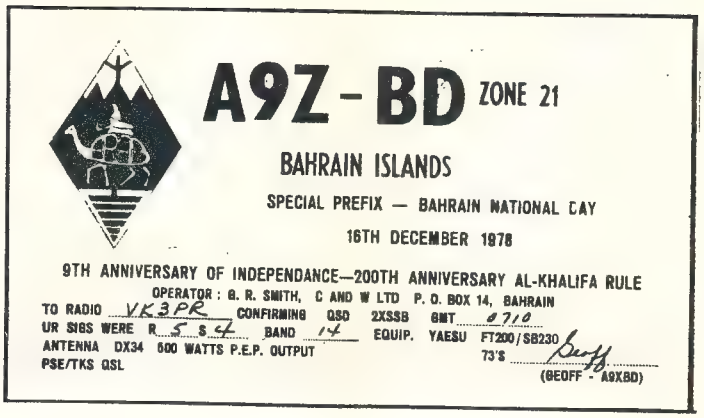
### A92EM and A9Z-BD

The military-style MP4B prefix gave way to the A9X prefix in the mid-1970s, not long after independence. This prefix in turn gave


STATE OF BAHRAIN
A92EM
P.O. BOX 5486, MANAMA, STATE OF BAHRAIN

| RADIO | DATE | GMT | MHz | MODE | RPRT |
|---|---|---|---|---|---|
| VK3MR | 22.12.84 | 2015 | 7 | cw | 579 |

Rig IC701
Ant TET HB443
TNX PSE QSL Snow
VIA BUREAU/DIRECT
OR G3XHZ
73's
JOHN FARRER


A9Z-BD ZONE 21
BAHRAIN ISLANDS
SPECIAL PREFIX — BAHRAIN NATIONAL DAY
16TH DECEMBER 1978
9TH ANNIVERSARY OF INDEPENDANCE—200TH ANNIVERSARY AL-KHALIFA RULE
OPERATOR : G. R. SMITH, C AND W LTD P. O. BOX 14, BAHRAIN
TO RADIO VK3PR CONFIRMING QSO 2XSSB GMT 0710
UR SIGS WERE R 5 S 4 BAND 14 EQUIP. YAESU FT200/SB230
ANTENNA DX34 600 WATTS P.E.P. OUTPUT
PSE/TKS QSL
73'S
(GEOFF - A9XBD)

way to the A92 prefix. The QSL A92EM shown here was for a QSO with Old Timer and well-known DXer, 'Snow' VK3MR in December 1984. Little wonder he received an S9 report using his series of rhombic antennas. The QTH of the Bahrein station was Manama, the only major city of Bahrein and also its chief port. The WIA collection also contains the QSL A9ZBD (rather than A92BD). This card is dated 16 December 1978 and celebrated Bahrein's national day. It also served to celebrate the 200th anniversary of Al Khalifa's rule. Considering the fact that operation was confined to one day only, the special A9Z prefix would indeed be a rare one. The Australian operator was SK Ron Jardine VK3PR of Leongatha, Victoria. His fine collection of QSL cards was kindly donated to the WIA by his widow, Vernie.

Bahrein has developed a tourist industry as well as having established itself as a banking centre for the area. It remains also as a rich source of the world's oil supply and therefore a very significant factor in the politics of the Middle-East.

## Can You Help?

If you would like to play a part in building up the WIA QSL collection and to save something for the future, would you please send a half-dozen (more if you can spare them) QSLs which you feel would really help the collection along.

All cards are appreciated but we especially need commemorative QSLs, special event station QSL, especially assigned call QSLs (eg VK4RAN), pre-war QSLs, unusual prefixes, rare DX and pictorial QSLs of not so common countries. Could you help? Send to PO Box 1, Seville 3139 or phone (059) 64 3721 for card pick-up or consignment arrangements for larger quantities of cards. **ar**

# CLUB CORNER

## Cunningham Radio Club Formed

On Saturday 18 August eight people sat for the Regulations, Morse, NAOCP and AOCP examinations at the Southern Downs Community College of TAFE in Warwick, Queensland. At 2pm of the same day a meeting was then held to discuss the potential for the formation of a local club. An attendance of 25, including representatives from the Wireless Institute of Australia, Queensland Division, resolved to form a radio club. The club's aims are to foster a community support for the hobby, encourage people to study toward their licence, and to be available in times of disaster for communications support.

The elected committee consists of the following: Chairman, Trevor Knight VK4NLX; Secretary, John Moulder VK4YX; Treasurer, Bill Washbourne VK4VJO; Publicity Officer, Bob Harper VK4KNH; Station Manager, Graham Muirhead VK4WEM; WICEN Officer, John Newley.

A second meeting was then held on 25 August, during which the name Cunningham Radio Club was chosen to represent an area centred on Warwick, Stanthorpe and regions. Trevor VK4NLX said that the club should accept membership from any area, but would endeavour to represent the region from the range to west of Goondiwindi, and from Toowoomba South to beyond the NSW border. A modest membership fee of $20 was chosen to encourage membership and assist the club to set up a local repeater.

An immediate project for the club, the 2m repeater is to service as much of the area as possible. Being situated on two of the major highways to Sydney, the repeater is seen to fill a gap between the northern NSW repeaters and the Brisbane, Ipswich and Gold Coast repeaters. A submission is already being prepared for the WIA and DoTC, but to date the frequencies and location have yet to be decided. Travellers will no doubt benefit from the added coverage and local support.

The club has already assembled a collection of components for the repeater, including a Philips FM828, a solar panel and battery, and a suitable antenna. As with all repeater projects, the cavity resonators remain the greatest problem, with manufacture seen as one possible alternative. Any donations of cavities would be greatly appreciated and would no doubt be seen in a similar light to winning the Lotto. Indeed, any donations towards the repeater would be greatly appreciated, and progress report will be sent to the magazine as completion draws near. Anybody interested in joining the club should contact Trevor or John at Audivision, Palmerin St, Warwick, phone (076) 61 3131 or on 146.500MHz.

If you are considering the NAOCP/AOCP examinations, you should contact Bob Harper, electrical teacher at the Southern Downs College of TAFE, (076) 61 6200, as classes may be run when student numbers are sufficient. The next class may run beginning February 1991.

**Bob Harper VK4KNH**

## Royal Naval Amateur Radio Society — NSW Chapter

The RNARS is looking for new members to join the NSW chapter. All seafarers — RAN, RN, Merchant Navy and past and serving members of ALL Navies and MNs of the world are invited to join our ranks.

We all share TWO things: our interest in amateur radio and the sea. All enquiries to the Secretary, C W Schreuder VK2CWS QTHR.

## Ballarat Hamvention

On Sunday 28 October 1990, the Ballarat Amateur Radio Group held its annual Hamvention at the Marty Busch Recreation Reserve at Sebastopol.

This year's event attracted a record crowd of happy amateurs and friends from VK2, 3, 5, 7, who were eager to do business with the various traders.

The Ballarat Hamvention has become a very happy venue where amateurs and friends can meet and discuss their hobby, with many attending for the first time this year.

Much of the credit for the success of the

Hamvention must go to the many traders and stall-holders who brought the new and used gear to the Hamvention.

The BARG Ladies Group again supplied a great BBQ lunch; many more than expected were fed in a short time.

Fox hunts were held after lunch and the results were:

Sniffer Hunt: VK3DIP

2m Fox Hunts: 1st Heat: VK3XMD Mark
2nd Heat: VK3DIP Paul

70cm Fox Hunt: VK3BQN

80m Fox Hunt: VK3DIP

Overall points winner: Paul VK3DIP

Winner of the CD player raffle was D Merret of Ballarat. Second raffle prize went to Bob Wiley of Seddon. Door prize winner was Mike VK3JFC.

The BARG wishes to thank all who attended and made it another successful event on the amateur calendar.

Planning for 1991 is under-way to make it larger and even more interesting.

**KEVIN HUGHES VK3WN ar**

# OVER TO YOU

ALL LETTERS FROM MEMBERS WILL BE CONSIDERED FOR PUBLICATION BUT MUST BE LESS THAN 200 WORDS. THE WIA ACCEPTS NO RESPONSIBILITY FOR OPINIONS EXPRESSED BY CORRESPONDENTS

## SE-Asian Pirates

I was surprised to read (Seanet Convention Report, AR September '90) that Ken Pincott saw so few hand-held radios in Singapore.

I've been in Singapore about 15 times in the past three years and I reckon there are more than 50 hand-helds on display in the Orchard Road shops alone.

All of the large shopping plazas in Singapore have shops offering video and hi-fi gear, cameras **and** amateur band hand-held radios made by Icom, Yaesu and Kenwood.

Ken observed that the shops insist that buyers have licences. In my experience, some do, some don't. Buyers who are obviously foreigners can buy what they like as long as they take it out of Singapore.

It remains a fact that the regulation and control of radio equipment and spectrum usage in SE-Asia is generally slack. The use of amateur 2m gear in Indonesia for CB-style operation is just one symptom of the problem.

Another is the "hams" I hear on SSB on the CW end of the 40 and 80m bands, chatting in Bahasa Indonesia/Malaysia and ignoring bandplans and requests to QSY. They do not sound like licensed amateurs.

**ANDREW DAVIS**
**VK1DA/V85DA**
**PO BOX 715,**
**SERIA 7007 BRUNEI**
**BORNEO, VIA SINGAPORE**

## What Price a Life?

A lot has been said about using Morse.

One aspect of major importance seems to have been overlooked during debate on this subject.

At the WARCs, deliberations of many people skilled in regulation of operations worldwide have resulted in the requirement for Morse code being established and retained.

We should come back to basics. There is a valid reason for the Morse requirement independent of other arguments.

Emergency situations occur and it is possible, and likely, that a radio call for help will be transmitted using Morse.

There are reasons why this can be the case. It takes little understanding to conclude that Morse may be the only available means of transmission.

If a microphone is unserviceable, keyboard broken etc, an emergency message is still possible provided an oscillator functions. It can be sent by tapping two wires together.

If you are operating on HF, with a likelihood of intercepting an emergency message, it is incumbent upon you to be able to recognise an emergency message.

I disagree that the requirement for Morse will eventually be repealed.

My feelings are that, given the common sense of deliberations in the past, it may be that the requirement is never dropped.

I ask 'would you wish to be the one responsible for loss of someone's life because you were incapable of receiving a few Morse symbols??'

I understand that US astronauts are required to have Morse capability.

Perhaps these comments may throw a light on an area many have not considered.

**IAN HUNT VK5QX**
**8 DEXTER DRIVE**
**SALISBURY EAST 5109**

## Morse Code for AOCP

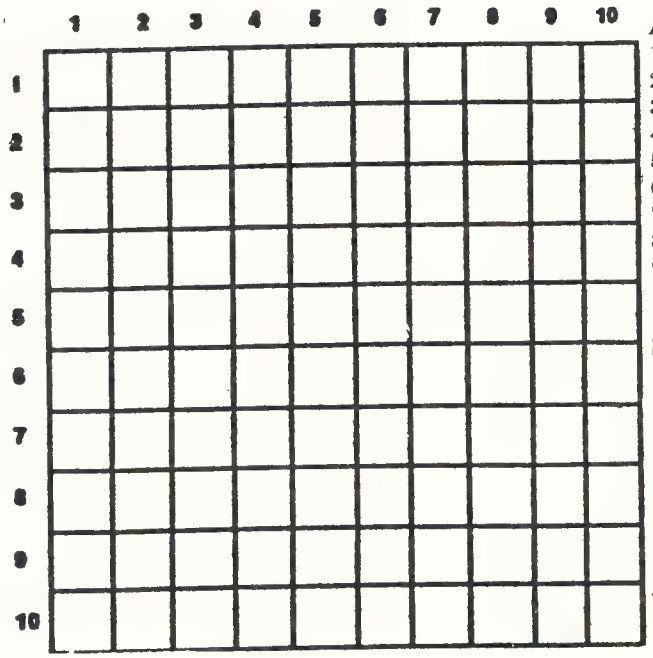
I have read members' comments proposing that Morse Code be discontinued as an AOCP exam subject.

I strongly object to the remarks of Peter (VK2PA) in October AR, claiming that some people —

(a) want extra HF privileges, but do not want to work for them;

(b) would like to become radio amateurs, but

## Morseword No 45



**Across**

1 Escape
2 Frosted
3 Wander
4 Vampires
5 Rub out
6 Bay
7 Informer
8 Listen
9 Smell is one
10 In that place

**Down**

1 ___Lyn, singer
2 Employs
3 Openings
4 Lie
5 Wharf
6 Ones and
7 Metal
8 Pictures
9 Shoot
10 Wonderful

Audrey Ryan © 1990

*Solution Page 56*

are not prepared to make the effort to learn the code etc.

May I remind Peter that there are many senior members of WIA who, suffering from blood pressure and/or stroke, are not able to take the pressure of 10wpm, although they passed 5wpm as novices. At present they have to be content with a "K" call.

In my case, I have passed 10wpm sending, continued with receiving practice, and sat for a number of exam tests. During the past two years, my brain (due to a stroke) will not function for five minutes at that speed without many errors due to fatigue.

The DoTC will not grant exemption even when claims are supported by medical certificates.

I would also suggest to Peter and others that there are many brilliant "K" call holders who would surpass some full call operators, in radio and electrical qualifications and ability (I exclude myself).

Perhaps Peter and others who make sweeping statements about lack of initiative and laziness will have another think!!

**Ian Ritson VK5KIR**
**66 Barker Ave**
**South Plymptom 5038**

## Historical Collector

In your October issue an article headed "Historical Collections" requests the notification of additional collectors.

I wish to advise that I am always looking for military radio equipment to add to my collection.

I have been collecting for many years and am in a position to help others with information etc if required.

I am actively restoring the equipment in the collection and have many operational pieces of equipment.

The restored equipment has featured in many displays including JOTA, WIA displays, "Trash and Treasure" days, as well as being the subject of lectures at Hornsby and Westlakes Radio Clubs. A major display was mounted at this year's Gosford Field Day, where I found great interest was shown in the gear.

I have just finished restoring a 1936 US Navy TRF regenerative TBR1 receiver which brought many comments at the W.A on Sunday.

I would be very pleased to hear from anyone disposing of such equipment, and would certainly promise the gear a good home.

**Ian O'Toole VK2ZIO**
**222 Old Northern Rd**
**Castle Hill 2154**
**(02) 680 2112**

## RD Contest

Logs for this contest vary greatly, from a single page to monsters of 20 pages plus. The work involves many hours of checking. In many hundreds of RD logs over the years, the honesty and error rate has been very commendable. Now, with many logs being generated by computer and the error rate of duplicates being almost nil, perhaps it's time to try something quite radical.

For next year's RD Contest would readers agree to the submission of a summary sheet ONLY.

From records kept for many years, it is known in advance how many logs will probably be received, and average scoring for each division.

I suggest a rule be added, stating that the contest co-ordinator may call up any log for checking, just to keep the possibility open of any log being required.

Postage is now expensive, so why line Australia Post's coffers? This could at present decide some operators when considering sending in their log.

**Neil Penfold VK6NE**
**Acting Federal Contest Co-ordinator**
**(FCM 1965-1981)**
**2 Moss Court**
**Kingsley 6026**

## Thanks for JOTA

I would like to thank John Jackson VK2FYD, John Watt VK2QN and Eric Fossey VK2JFY of Blue Mountains Amateur Radio Club for their wholehearted effort, support and time during the recent JOTA.

These operators spend weeks before organising gear and aerials to make the Emu Plains JOTA the best station and weekend I have ever been involved in. The boys went away from the base very happy and enthusiastic about coming to the next JOTA, some even enquiring about becoming licensed amateurs.

The Scouts enjoyed talking to stations in New Zealand, WA, SA, Vic, Qld, NSW, Tasmania, Oman, London, America and many more.

As most people would know, a Scout's favourite contact would be with Guides, and our Scouts got their fair share of QSL addresses from Guide stations.

The Blue Mountains Amateur Radio Club is no longer just a little radio club in the mountains. It is a driving force behind amateur radio operations in the Mountain Scouts districts and Penrith District. Once again, I would like to thank the operators, and hope to see you next year when our Scouts erect a tower for the aerials.

I myself hope to have my licence by next October '91 JOIA.

**Mark Gapps**
**1st Emu Plains Scout Group**

## 'AR' Technical Content

I read with dismay the item in November asking whether 'Amateur Radio' magazine should follow the trend away from technical articles and concentrate more on simple projects, equipment reviews and so on.

My answer to this is a thousand times NO.

The technical content of 'AR' has decreased in recent years, and it is already difficult to get any useful information without subscribing to overseas magazines. Even the occasional overseas article not reprinted leaves many areas with no material available in this country. So we slide further into becoming a bunch of inward-looking appliance operators.

Technical competence is the basis of our hobby. Without it, we would resemble CBers, and certainly could not justify the spectrum space we use. We should be boosting our technical standards rather than letting them decline any further.

Many amateurs are WIA members solely because of the magazine. If the technical content is reduced any further these people would see less reason to remain members, and new amateurs would see less reason to join. Anyone who wants to read only equipment reviews and trivia can go to a newsagent and buy another magazine which covers these areas quite well.

The WIA exists to develop the hobby and to provide services to its members. The magazine is a crucial part of these responsibilities. To downgrade it any further would be a disservice and an insult to Australian amateurs.

**John Martin VK3ZJC**
**3 Vernal Ave**
**Mitcham 3132**


# A Call to all Holders of a Novice Licence

**Now you have joined the ranks of amateur radio, why not extend your activities?**

The Wireless Institute of Australia (N.S.W. Division) conducts a Bridging Correspondence Course for the AOCP and LAOCP Examinations.

Throughout the Course, your papers are checked and commented upon to lead you to a successful conclusion.

*For further details write to:*

The Course Supervisor
WIA
PO Box 1066
Parramatta NSW 2124
(109 Wigram Street, Parramatta)
Phone: (02) 689 2417

**11am to 2pm Monday to Friday**
**7 to 9pm Wednesday**

## SILENT KEYS

DUE TO INCREASING SPACE DEMANDS OBITUARIES MUST BE NO LONGER THAN 200 WORDS

We regret to announce the recent passing of:
Mr Neil Burne VK2GAT
Mr F A Maher VK3FZ
Mr D G Goode VK5BF
Mr R N Wreford VK5NW
Mr I A Broughton VK6AAK

### Francis Anthony Maher VK3FZ

Frank Maher passed away on 24.10.90 at Royal Melbourne Hospital, aged 78.

First licensed in the late '20s, he used CW on his homebrew equipment until TV, then upgraded to a Galaxy V and Kenwood TS520.

In April 1929 he was apprenticed to the printing industry and spent his entire working life in the trade, ending up with his own business. He retired in 1982, after a stroke, but continued to enjoy an active amateur radio life.

He was a good father and husband to his family, a good friend to many, and will be sadly missed.

ALLEN CREWTHER VK3SM

### Neil Burne VK2GAT

Neil Burne passed away 4.3.90, aged 43 years.

He looked forward to your magazine and got a lot of knowledge and enjoyment out of it. He was confined to a wheelchair, and your magazine took away a lot of the boredom for him. He had purchased an Icom IC25A handheld after your write-up on them, for safety reasons in the car, and it worked well.

DONNA GRAY

### Claude Singleton VK4UX

Jessie and family would like to thank amateurs Australia-wide for messages of condolence received at the loss of Claude VK4UX who passed away suddenly 14.9.90, aged 76 years.

Thank you most sincerely We were married for 49 years and I never bothered to get a callsign.

JESSIE SINGLETON

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AT YOUR NEWSAGENT EVERY MONTH.

# HF PREDICTIONS

ROGER HARRISON VK2ZTB
THE APOGEE GROUP

## December Charts

For ease of use and to accommodate space restrictions in the magazine, I have provided predictions applicable for three major regions of Australia:

**VK EAST** Covers the major part of NSW and Queensland.

**VK SOUTH** Covers southern-NSW, VK3, VK5 and VK7.

**VK WEST** Covers the south-west of West Australia.

For each of these regions I have selected six "terminals" to major continental regions of the world. Note that, this month, I have included charts for **South Georgia and the South Sandwich Islands** as there will be DXpeditions there early this month. Despite being geographically close, there are marked differences between the predictions, as you can see, which is the reason I did not do one set to cover the region.

Predictions for the long path to Europe are included again this month.

## The charts explained

These charts are different to those you see published elsewhere, and arguably more useful to the amateur fraternity as they give, effectively, the predicted signal/noise ratio for each hour and for selected bands.

The charts are organised in 24 rows, one for each hour UTC (first column on the left). Don't forget to add the appropriate number of hours for your time zone, including daylight saving where it applies. The next column gives the MUF (maximum usable frequency) for each hour, followed by the field strength at the MUF, in decibels referred to 1 uV/metre (dBU). The column marked FOT gives the "optimum" frequency - the most reliable frequency for the path.

Then come five columns, one for each of five selected HF bands. The numbers in the column represent predicted field strength at each hour in decibels referred to 1 uV/metre. Here it represents "raw" signal to noise ratio as urban noise levels are typically 1-2 uV/metre, but does not take into account the advantage offered by particular transmission modes. The results are based on a transmitter power of 100 W output (except where noted later), the use of modest 3-element beams or similar, and for "median" conditions. Where the results fall below -40 dB, no output is printed.

Enhanced conditions may improve S/N ratios by 9-15 dB. The use of CW or digital transmission modes show better results than SSB. If you've got 400 W output, you get a 6 dB improvements. Where conditions warrant it, I have include predictions for the bands below 14 MHz, deleting the upper bands.

## Ten Metres

The predictions look a little pessimistic for ten metres, but it only takes a slight "lift" in conditions to provide openings on this band. Keep a watch on the short-term geomagnetic and propagation forecasts.

## South Georgia & South Sandwich Is.

These islands are in the southern Atlantic ocean, south east of the southern tip of South America, and not far from Antarctica. Propagation to this region from Australia is poor as the path is across the southern polar ionosphere, passing across the auroral zone. For these predictions I have assumed 400 watts of power -you'll need it, and/or better-than-average conditions.

I ran "trial" long path predictions, too. Curiously, it can provide marginally better signal strengths, on 14 and 18 MHz, **but** you get only two very narrow "windows", perhaps an hour each, centred on 0800 and again at 2000 hours UTC. For thelong path to South Georgie and the South Sandwich Islands, point your beams pretty well due north.

**ar**

| UTC | MUF | DBU | FOT | 10.1 | 14.2 | 18.1 | 21.2 | 24.9 |
|---|---|---|---|---|---|---|---|---|
| 1 | 14.2 | -10 | 11.9 | ... | -10 | -2 | -2 | -7 |
| 2 | 14.2 | -9 | 12.2 | ... | -10 | -1 | -2 | -7 |
| 3 | 14.3 | -9 | 12.1 | -40 | -9 | -1 | -2 | -7 |
| 4 | 14.4 | -7 | 11.9 | -39 | -8 | -1 | -1 | -6 |
| 5 | 14.6 | -6 | 11.6 | -36 | -7 | 0 | -2 | -8 |
| 6 | 14.8 | -5 | 11.5 | -35 | -7 | -1 | -2 | -9 |
| 7 | 15.0 | -4 | 11.7 | -34 | -6 | 0 | -2 | -8 |
| 8 | 15.0 | -2 | 12.2 | -31 | -4 | 2 | 0 | -6 |
| 9 | 14.7 | 1 | 11.9 | -24 | -1 | 4 | 2 | -5 |
| 10 | 14.6 | 4 | 11.7 | -16 | 3 | 6 | 2 | -5 |
| 11 | 14.3 | 4 | 11.4 | -13 | 4 | 6 | 2 | -7 |
| 12 | 14.1 | 3 | 11.2 | -14 | 4 | 5 | 1 | -8 |
| 13 | 13.9 | 2 | 11.4 | -15 | 3 | 4 | 0 | -9 |
| 14 | 13.6 | 1 | 10.9 | -15 | 2 | 4 | -1 | -10 |
| 15 | 13.4 | 0 | 10.8 | -16 | 2 | 3 | -2 | -12 |
| 16 | 13.3 | -1 | 10.8 | -17 | 1 | 2 | -2 | -12 |
| 17 | 13.4 | -2 | 10.7 | -19 | 0 | 2 | -2 | -11 |
| 18 | 13.6 | -3 | 10.9 | -23 | -1 | 2 | -2 | -10 |
| 19 | 14.1 | -5 | 11.1 | -31 | -5 | 1 | -1 | -8 |
| 20 | 14.6 | -6 | 12.3 | -38 | -8 | 0 | -1 | -6 |
| 21 | 14.7 | -7 | 12.5 | ... | -10 | -1 | -1 | -5 |
| 22 | 14.8 | -8 | 12.6 | ... | -10 | -1 | -1 | -5 |
| 23 | 14.7 | -9 | 12.6 | ... | -11 | -1 | -1 | -6 |
| 24 | 14.6 | -8 | 12.6 | ... | -10 | -1 | -1 | -6 |

VK EAST – STH GEORGIA IS.

| UTC | MUF | DBU | FOT | 10.1 | 14.2 | 18.1 | 21.2 | 24.9 |
|---|---|---|---|---|---|---|---|---|
| 1 | 13.6 | -7 | 11.7 | -31 | -5 | 0 | -3 | -10 |
| 2 | 13.3 | -8 | 11.1 | -30 | -5 | -1 | -4 | -11 |
| 3 | 13.3 | -8 | 11.4 | -30 | -5 | -1 | -3 | -11 |
| 4 | 13.4 | -8 | 11.1 | -30 | -5 | -1 | -4 | -11 |
| 5 | 13.6 | -7 | 11.0 | -29 | -5 | -1 | -4 | -13 |
| 6 | 13.7 | -7 | 11.2 | -30 | -5 | -1 | -4 | -12 |
| 7 | 14.0 | -6 | 11.6 | -31 | -5 | 0 | -2 | -9 |
| 8 | 14.1 | -5 | 12.1 | -31 | -4 | 1 | -1 | -8 |
| 9 | 14.1 | -4 | 11.5 | -28 | -3 | 2 | -1 | -8 |
| 10 | 13.9 | -2 | 11.3 | -23 | -1 | 3 | -1 | -9 |
| 11 | 13.8 | 0 | 11.1 | -18 | 1 | 3 | -1 | -9 |
| 12 | 13.6 | 1 | 10.9 | -16 | 2 | 3 | -1 | -10 |
| 13 | 13.4 | 1 | 10.7 | -14 | 3 | 3 | -2 | -11 |
| 14 | 13.3 | 1 | 10.7 | -14 | 3 | 3 | -2 | -12 |
| 15 | 13.1 | 0 | 10.2 | -14 | 2 | 2 | -3 | -13 |
| 16 | 12.9 | -1 | 10.0 | -15 | 2 | 2 | -4 | -15 |
| 17 | 12.8 | -2 | 10.0 | -16 | 1 | 1 | -4 | -15 |
| 18 | 12.9 | -3 | 10.2 | -18 | 0 | 1 | -4 | -15 |
| 19 | 13.1 | -5 | 10.7 | -23 | -2 | 0 | -4 | -13 |
| 20 | 13.4 | -6 | 10.6 | -28 | -4 | 0 | -3 | -11 |
| 21 | 13.7 | -6 | 11.5 | -30 | -5 | 0 | -2 | -10 |
| 22 | 13.8 | -7 | 11.7 | -32 | -5 | 0 | -2 | -9 |
| 23 | 13.8 | -6 | 11.8 | -32 | -5 | 0 | -2 | -9 |
| 24 | 13.7 | -6 | 11.8 | -30 | -5 | 0 | -2 | -9 |

VK STH – STH GEORGIA IS.

| UTC | MUF | DBU | FOT | 10.1 | 14.2 | 18.1 | 21.2 | 24.9 |
|---|---|---|---|---|---|---|---|---|
| 1 | 13.6 | -4 | 11.3 | -26 | -3 | 1 | -1 | -9 |
| 2 | 14.1 | -5 | 11.7 | -31 | -5 | 1 | -1 | -7 |
| 3 | 14.2 | -6 | 11.6 | -35 | -7 | 0 | -1 | -7 |
| 4 | 14.3 | -8 | 11.3 | -38 | -8 | -1 | -2 | -8 |
| 5 | 14.2 | -9 | 11.1 | -40 | -9 | -2 | -3 | -9 |
| 6 | 14.1 | -11 | 11.4 | ... | -11 | -3 | -3 | -8 |
| 7 | 13.7 | -14 | 11.7 | ... | -12 | -3 | -3 | -8 |
| 8 | 13.8 | -14 | 11.6 | ... | -12 | -3 | -3 | -8 |
| 9 | 13.8 | -13 | 11.6 | ... | -12 | -3 | -3 | -8 |
| 10 | 14.0 | -11 | 11.6 | ... | -10 | -2 | -2 | -8 |
| 11 | 14.1 | -8 | 11.6 | -39 | -8 | -1 | -1 | -7 |
| 12 | 14.4 | -4 | 11.8 | -31 | -4 | 2 | 0 | -6 |
| 13 | 14.6 | 0 | 11.8 | -24 | -1 | 4 | 2 | -5 |
| 14 | 14.5 | 3 | 11.7 | -19 | 2 | 5 | 2 | -5 |
| 15 | 14.2 | 4 | 11.4 | -16 | 3 | 6 | 2 | -6 |
| 16 | 14.1 | 5 | 11.2 | -12 | 5 | 6 | 2 | -7 |
| 17 | 13.9 | 6 | 10.9 | -9 | 6 | 6 | 1 | -8 |
| 18 | 13.6 | 7 | 10.6 | -6 | 8 | 7 | 1 | -9 |
| 19 | 13.5 | 8 | 10.3 | -3 | 9 | 7 | 1 | -10 |
| 20 | 13.2 | 9 | 10.2 | 0 | 9 | 7 | 0 | -12 |
| 21 | 13.0 | 6 | 10.3 | -5 | 7 | 5 | -2 | -13 |
| 22 | 12.9 | 0 | 10.4 | -14 | 3 | 3 | -2 | -13 |
| 23 | 13.0 | -2 | 10.5 | -17 | 1 | 2 | -3 | -12 |
| 24 | 13.2 | -3 | 10.8 | -21 | -1 | 2 | -2 | -11 |

VK WEST – STH GEORGIA IS.

| UTC | MUF | DBU | FOT | 10.1 | 14.2 | 18.1 | 21.2 | 24.9 |
|---|---|---|---|---|---|---|---|---|
| 1 | 14.1 | -9 | 12.2 | -40 | -9 | -1 | -2 | -7 |
| 2 | 13.8 | -11 | 11.5 | -40 | -9 | -2 | -3 | -9 |
| 3 | 13.8 | -11 | 11.5 | -40 | -9 | -2 | -3 | -9 |
| 4 | 13.9 | -10 | 11.2 | -38 | -9 | -2 | -4 | -10 |
| 5 | 14.1 | -10 | 11.2 | -39 | -9 | -3 | -4 | -10 |
| 6 | 14.2 | -9 | 11.4 | -39 | -9 | -2 | -4 | -10 |
| 7 | 14.5 | -7 | 12.0 | -38 | -8 | -1 | -2 | -8 |
| 8 | 14.7 | -5 | 12.7 | -35 | -6 | 1 | 0 | -5 |
| 9 | 14.6 | -1 | 11.9 | -28 | -3 | 3 | 1 | -5 |
| 10 | 14.4 | 2 | 11.7 | -19 | 2 | 5 | 2 | -6 |
| 11 | 14.3 | 4 | 11.5 | -14 | 4 | 6 | 2 | -7 |
| 12 | 14.0 | 3 | 11.2 | -14 | 4 | 5 | 1 | -8 |
| 13 | 13.9 | 3 | 11.0 | -13 | 4 | 5 | 0 | -9 |
| 14 | 13.7 | 3 | 11.3 | -13 | 4 | 4 | 0 | -10 |
| 15 | 13.5 | 2 | 10.8 | -13 | 4 | 4 | -1 | -11 |
| 16 | 13.3 | 2 | 10.7 | -12 | 3 | 3 | -2 | -12 |
| 17 | 13.2 | 2 | 10.6 | -12 | 3 | 3 | -2 | -13 |
| 18 | 13.2 | 0 | 10.8 | -16 | 2 | 2 | -2 | -12 |
| 19 | 13.5 | -4 | 11.2 | -24 | -2 | 1 | -2 | -11 |
| 20 | 13.8 | -6 | 10.9 | -31 | -5 | 0 | -2 | -9 |
| 21 | 14.2 | -7 | 11.9 | -36 | -7 | 0 | -1 | -7 |
| 22 | 14.3 | -7 | 12.1 | -38 | -8 | 0 | -1 | -7 |
| 23 | 14.4 | -8 | 12.2 | -39 | -8 | -1 | -1 | -6 |
| 24 | 14.3 | -8 | 12.2 | -39 | -9 | -1 | -2 | -7 |

VK EAST – STH SANDWICH IS.

| UTC | MUF | DBU | FOT | 10.1 | 14.2 | 18.1 | 21.2 | 24.9 |
|---|---|---|---|---|---|---|---|---|
| 1 | 15.0 | -1 | 12.8 | -31 | -4 | 3 | 2 | -3 |
| 2 | 14.8 | -2 | 12.1 | -32 | -4 | 2 | 1 | -5 |
| 3 | 14.7 | -3 | 11.9 | -32 | -5 | 1 | 0 | -7 |
| 4 | 14.4 | -5 | 11.9 | -32 | -5 | 1 | -1 | -7 |
| 5 | 14.5 | -5 | 12.2 | -35 | -6 | 1 | -1 | -6 |
| 6 | 14.6 | -5 | 12.4 | -36 | -6 | 1 | 1 | -5 |
| 7 | 14.9 | -4 | 12.5 | -36 | -6 | 2 | 1 | -4 |
| 8 | 15.0 | -2 | 12.6 | -34 | -5 | 2 | 2 | -3 |
| 9 | 15.3 | 0 | 12.7 | -31 | -3 | 4 | 3 | -2 |
| 10 | 15.4 | 3 | 12.7 | -25 | 0 | 6 | 5 | -1 |
| 11 | 15.4 | 5 | 12.6 | -20 | 3 | 7 | 5 | -1 |
| 12 | 15.3 | 7 | 12.4 | -16 | 5 | 8 | 6 | -1 |
| 13 | 15.2 | 8 | 12.2 | -12 | 6 | 9 | 6 | -1 |
| 14 | 15.0 | 8 | 11.8 | -12 | 7 | 9 | 6 | -2 |
| 15 | 14.8 | 8 | 11.4 | -11 | 7 | 9 | 5 | -3 |
| 16 | 14.8 | 8 | 11.2 | -9 | 7 | 8 | 4 | -4 |
| 17 | 14.6 | 7 | 10.9 | -10 | 6 | 7 | 3 | -6 |
| 18 | 14.4 | 6 | 11.0 | -11 | 6 | 7 | 2 | -7 |
| 19 | 14.3 | 3 | 11.2 | -17 | 3 | 5 | 2 | -6 |
| 20 | 14.3 | 1 | 11.7 | -22 | 0 | 4 | 2 | -5 |
| 21 | 14.5 | 0 | 12.0 | -26 | -1 | 4 | 2 | -5 |
| 22 | 14.7 | -1 | 12.3 | -28 | -2 | 4 | 2 | -4 |
| 23 | 14.9 | 0 | 12.6 | -28 | -2 | 4 | 3 | -3 |
| 24 | 15.0 | 0 | 12.7 | -29 | -3 | 4 | 3 | -3 |

VK STH – STH SANDWICH IS.

| UTC | MUF | DBU | FOT | 10.1 | 14.2 | 18.1 | 21.2 | 24.9 |
|---|---|---|---|---|---|---|---|---|
| 1 | 15.2 | 2 | 12.1 | -25 | 0 | 5 | 3 | -3 |
| 2 | 15.3 | -1 | 11.9 | -30 | -3 | 3 | 1 | -5 |
| 3 | 15.2 | -3 | 11.9 | -35 | -6 | 1 | 0 | -5 |
| 4 | 15.3 | -4 | 12.1 | -38 | -8 | 1 | 0 | -5 |
| 5 | 16.0 | -4 | 12.7 | ... | -10 | 0 | 1 | -3 |
| 6 | 15.9 | -5 | 12.9 | ... | -12 | -1 | 1 | -2 |
| 7 | 15.4 | -7 | 12.8 | ... | -12 | -1 | 0 | -4 |
| 8 | 15.4 | -7 | 12.7 | ... | -12 | -1 | 0 | -4 |
| 9 | 15.5 | -6 | 12.7 | ... | -11 | -1 | 0 | -3 |
| 10 | 15.6 | -4 | 12.7 | ... | -10 | 0 | 1 | -3 |
| 11 | 15.8 | -2 | 12.8 | -39 | -7 | 2 | 2 | -2 |
| 12 | 16.2 | 3 | 13.0 | -30 | -2 | 5 | 5 | 0 |
| 13 | 16.4 | 7 | 13.0 | -22 | 2 | 8 | 7 | 1 |
| 14 | 16.3 | 9 | 12.9 | -14 | 6 | 10 | 8 | 2 |
| 15 | 16.0 | 10 | 12.5 | -11 | 8 | 10 | 8 | 1 |
| 16 | 15.8 | 12 | 12.1 | -6 | 10 | 11 | 8 | 1 |
| 17 | 15.4 | 13 | 11.7 | -1 | 12 | 12 | 8 | -1 |
| 18 | 15.2 | 15 | 11.4 | 4 | 15 | 13 | 8 | -1 |
| 19 | 14.9 | 16 | 11.1 | 8 | 16 | 13 | 8 | -2 |
| 20 | 14.6 | 16 | 11.0 | 9 | 16 | 13 | 7 | -4 |
| 21 | 14.3 | 14 | 11.2 | 5 | 14 | 11 | 5 | -6 |
| 22 | 14.3 | 8 | 11.2 | -6 | 8 | 8 | 3 | -6 |
| 23 | 14.3 | 6 | 11.4 | -11 | 6 | 7 | 3 | -6 |
| 24 | 14.7 | 3 | 11.7 | -18 | 3 | 6 | 3 | -5 |

VK WEST – STH SANDWICH IS.

| UTC | MUF | DBU | FOT | 10.1 | 14.2 | 18.1 | 21.2 | 24.9 |
|---|---|---|---|---|---|---|---|---|
| 1 | 18.3 | -8 | 12.8 | ... | -19 | -8 | -6 | -9 |
| 2 | 20.0 | -8 | 14.0 | ... | -26 | -11 | -7 | -7 |
| 3 | 21.1 | -9 | 14.8 | ... | -34 | -15 | -9 | -8 |
| 4 | 21.7 | -11 | 15.2 | ... | ... | -19 | -12 | -9 |
| 5 | 21.8 | -13 | 15.3 | ... | ... | -22 | -14 | -10 |
| 6 | 22.0 | -13 | 15.4 | ... | ... | -23 | -14 | -10 |
| 7 | 21.4 | -14 | 15.0 | ... | ... | -23 | -15 | -11 |
| 8 | 21.3 | -14 | 14.9 | ... | ... | -22 | -14 | -10 |
| 9 | 20.8 | -13 | 14.5 | ... | -40 | -19 | -12 | -10 |
| 10 | 20.6 | -10 | 14.4 | ... | -34 | -15 | -10 | -8 |
| 11 | 20.5 | -7 | 14.3 | ... | -26 | -11 | -7 | -7 |
| 12 | 20.5 | -4 | 14.5 | ... | -18 | -6 | -3 | -4 |
| 13 | 20.3 | 0 | 14.5 | -38 | -9 | -1 | 0 | -3 |
| 14 | 19.7 | 4 | 14.2 | -20 | 0 | 8 | 3 | -1 |
| 15 | 19.4 | 9 | 13.8 | 1 | 10 | 10 | 7 | 0 |
| 16 | 18.6 | 13 | 13.4 | 16 | 18 | 14 | 8 | 0 |
| 17 | 17.8 | 14 | 13.0 | 21 | 19 | 14 | 8 | -2 |
| 18 | 17.1 | 15 | 12.6 | 23 | 20 | 13 | 6 | -4 |
| 19 | 17.4 | 16 | 12.2 | 25 | 22 | 15 | 7 | -3 |
| 20 | 17.2 | 15 | 11.8 | 22 | 19 | 13 | 6 | -4 |
| 21 | 16.5 | 9 | 11.3 | 5 | 10 | 7 | 1 | -8 |
| 22 | 16.1 | 3 | 11.1 | -10 | 2 | 2 | -3 | -11 |
| 23 | 16.3 | -2 | 11.3 | -25 | -5 | -2 | -5 | -11 |
| 24 | 17.0 | -6 | 11.8 | -38 | -11 | -5 | -6 | -10 |

## VK EAST — AFRICA

| UTC | MUF | DBU | FOT | 14.2 | 18.1 | 21.2 | 24.9 | 28.5 |
|---|---|---|---|---|---|---|---|---|
| 1 | 17.4 | -5 | 12.0 | -11 | -5 | -5 | -10 | -18 |
| 2 | 19.0 | -6 | 13.5 | -18 | -7 | -5 | -8 | -13 |
| 3 | 19.3 | -9 | 13.8 | -25 | -11 | -8 | -9 | -13 |
| 4 | 19.2 | -13 | 13.7 | -32 | -15 | -11 | -10 | -14 |
| 5 | 18.8 | -16 | 13.4 | -36 | -18 | -13 | -12 | -15 |
| 6 | 18.8 | -17 | 13.3 | -38 | -19 | -13 | -12 | -15 |
| 7 | 18.8 | -18 | 13.3 | -39 | -20 | -14 | -12 | -15 |
| 8 | 19.2 | -16 | 13.6 | -38 | -19 | -13 | -12 | -14 |
| 9 | 19.3 | -15 | 13.8 | -36 | -18 | -12 | -11 | -14 |
| 10 | 19.0 | -13 | 13.4 | -32 | -15 | -11 | -11 | -14 |
| 11 | 18.4 | -12 | 12.9 | -26 | -12 | -9 | -10 | -15 |
| 12 | 18.1 | -8 | 12.6 | -18 | -8 | -7 | -10 | -16 |
| 13 | 17.5 | -5 | 12.2 | -11 | -5 | -5 | -10 | -17 |
| 14 | 17.0 | -1 | 11.8 | -4 | -1 | -3 | -10 | -19 |
| 15 | 16.5 | 5 | 11.6 | 5 | 4 | -1 | -10 | -21 |
| 16 | 15.9 | 13 | 11.0 | 15 | 8 | 0 | -11 | -25 |
| 17 | 15.4 | 14 | 10.7 | 16 | 8 | -1 | -14 | -28 |
| 18 | 15.1 | 15 | 10.6 | 17 | 8 | -2 | -15 | -30 |
| 19 | 15.3 | 16 | 10.8 | 18 | 9 | -1 | -14 | -29 |
| 20 | 16.0 | 15 | 11.3 | 18 | 10 | 1 | -11 | -25 |
| 21 | 15.7 | 10 | 10.9 | 12 | 6 | -2 | -13 | -26 |
| 22 | 15.3 | 5 | 10.7 | 5 | 2 | -5 | -15 | -28 |
| 23 | 15.5 | 0 | 10.9 | 0 | -1 | -6 | -15 | -26 |
| 24 | 16.2 | -3 | 11.5 | -5 | -3 | -6 | -13 | -23 |

## VK STH — AFRICA

| UTC | MUF | DBU | FOT | 14.2 | 18.1 | 21.2 | 24.9 | 28.5 |
|---|---|---|---|---|---|---|---|---|
| 1 | 19.6 | 5 | 14.7 | 2 | 5 | 4 | -1 | -9 |
| 2 | 21.5 | 3 | 16.0 | -5 | 2 | 3 | 0 | -5 |
| 3 | 23.6 | 1 | 17.8 | -15 | -3 | 1 | 0 | -3 |
| 4 | 24.0 | -2 | 19.4 | -24 | -8 | -3 | -2 | -4 |
| 5 | 23.6 | -4 | 17.5 | -30 | -12 | -6 | -4 | -6 |
| 6 | 23.4 | -6 | 19.2 | -34 | -14 | -8 | -5 | -7 |
| 7 | 22.6 | -7 | 18.5 | -35 | -15 | -9 | -7 | -8 |
| 8 | 22.4 | -8 | 18.3 | -35 | -16 | -9 | -7 | -8 |
| 9 | 22.1 | -8 | 17.9 | -34 | -15 | -9 | -7 | -9 |
| 10 | 22.1 | -6 | 17.9 | -30 | -13 | -7 | -6 | -8 |
| 11 | 22.0 | -4 | 18.2 | -25 | -9 | -5 | -4 | -7 |
| 12 | 21.6 | -2 | 17.4 | -16 | -4 | -2 | -3 | -7 |
| 13 | 21.2 | 2 | 17.0 | -7 | 1 | 2 | -1 | -6 |
| 14 | 20.7 | 6 | 16.5 | 3 | 7 | 5 | 1 | -6 |
| 15 | 20.4 | 10 | 16.2 | 14 | 13 | 9 | 3 | -5 |
| 16 | 19.9 | 14 | 15.7 | 20 | 16 | 11 | 3 | -6 |
| 17 | 19.5 | 15 | 15.8 | 22 | 17 | 11 | 3 | -7 |
| 18 | 18.8 | 15 | 14.6 | 23 | 17 | 10 | 1 | -10 |
| 19 | 18.0 | 16 | 13.9 | 23 | 16 | 9 | -1 | -13 |
| 20 | 17.3 | 17 | 13.2 | 23 | 15 | 7 | -4 | -16 |
| 21 | 17.7 | 17 | 13.3 | 23 | 16 | 8 | -3 | -15 |
| 22 | 18.4 | 16 | 13.7 | 23 | 16 | 9 | 0 | -12 |
| 23 | 18.6 | 13 | 14.2 | 18 | 14 | 8 | 0 | -11 |
| 24 | 18.9 | 9 | 14.3 | 10 | 10 | 6 | -1 | -10 |

## VK WEST — AFRICA

| UTC | MUF | DBU | FOT | 14.2 | 18.1 | 21.2 | 24.9 | 28.5 |
|---|---|---|---|---|---|---|---|---|
| 1 | 24.7 | 2 | 20.2 | -18 | -3 | 1 | 2 | -1 |
| 2 | 25.4 | 2 | 19.2 | -20 | -4 | 1 | 2 | 0 |
| 3 | 25.8 | 2 | 21.4 | -20 | -4 | 1 | 2 | 0 |
| 4 | 25.4 | 2 | 20.9 | -19 | -4 | 1 | 2 | 0 |
| 5 | 24.9 | 2 | 20.4 | -17 | -2 | 2 | 2 | -1 |
| 6 | 24.2 | 3 | 19.8 | -12 | 0 | 3 | 2 | -1 |
| 7 | 23.6 | 4 | 19.2 | -5 | 4 | 5 | 3 | -1 |
| 8 | 23.3 | 8 | 19.4 | 5 | 10 | 9 | 6 | 0 |
| 9 | 22.8 | 12 | 18.4 | 18 | 17 | 14 | 8 | 1 |
| 10 | 22.5 | 13 | 18.1 | 22 | 20 | 15 | 9 | 1 |
| 11 | 22.5 | 14 | 18.0 | 25 | 21 | 17 | 9 | 1 |
| 12 | 22.8 | 15 | 18.2 | 27 | 23 | 18 | 11 | 3 |
| 13 | 22.8 | 16 | 18.1 | 30 | 24 | 19 | 12 | 3 |
| 14 | 22.6 | 16 | 18.4 | 29 | 24 | 19 | 11 | 2 |
| 15 | 21.3 | 16 | 16.7 | 28 | 22 | 16 | 8 | -2 |
| 16 | 20.2 | 16 | 15.7 | 27 | 20 | 13 | 4 | -7 |
| 17 | 19.0 | 16 | 14.7 | 25 | 18 | 10 | -1 | -13 |
| 18 | 18.5 | 16 | 14.2 | 25 | 17 | 9 | -3 | -16 |
| 19 | 17.2 | 12 | 13.2 | 20 | 9 | -2 | -17 | -34 |
| 20 | 16.2 | 10 | 12.5 | 15 | 8 | -7 | -24 | ... |
| 21 | 20.1 | 6 | 15.1 | 12 | 10 | 4 | -5 | -16 |
| 22 | 24.2 | 8 | 18.9 | 5 | 10 | 10 | 7 | 2 |
| 23 | 24.3 | 5 | 19.3 | -7 | 3 | 5 | 4 | 0 |
| 24 | 24.2 | 2 | 19.5 | -13 | -1 | 2 | 2 | -1 |

## VK EAST — ASIA

| UTC | MUF | DBU | FOT | 14.2 | 18.1 | 21.2 | 24.9 | 28.5 |
|---|---|---|---|---|---|---|---|---|
| 1 | 24.3 | -1 | 19.4 | -22 | -6 | -2 | -1 | -3 |
| 2 | 24.6 | -1 | 20.0 | -25 | -8 | -3 | -1 | -3 |
| 3 | 24.5 | -1 | 20.3 | -26 | -9 | -3 | -1 | -3 |
| 4 | 24.4 | -1 | 20.1 | -25 | -8 | -3 | -1 | -3 |
| 5 | 23.6 | -2 | 19.4 | -23 | -7 | -3 | -2 | -5 |
| 6 | 23.2 | -1 | 19.0 | -19 | -5 | -1 | -1 | -5 |
| 7 | 22.7 | 1 | 18.5 | -13 | -2 | 1 | -1 | -5 |
| 8 | 22.5 | 4 | 18.3 | -3 | 4 | 8 | 2 | -4 |
| 9 | 22.2 | 11 | 18.0 | 15 | 15 | 12 | 6 | -1 |
| 10 | 21.7 | 13 | 17.5 | 22 | 19 | 14 | 7 | -2 |
| 11 | 21.5 | 14 | 17.3 | 24 | 20 | 14 | 7 | -3 |
| 12 | 21.1 | 14 | 16.8 | 25 | 20 | 14 | 6 | -4 |
| 13 | 21.1 | 15 | 16.8 | 26 | 21 | 15 | 6 | -4 |
| 14 | 20.8 | 15 | 16.4 | 27 | 21 | 14 | 5 | -5 |
| 15 | 20.5 | 15 | 16.2 | 27 | 20 | 14 | 4 | -6 |
| 16 | 19.7 | 15 | 15.4 | 26 | 18 | 11 | 1 | -10 |
| 17 | 18.8 | 15 | 14.5 | 24 | 16 | 9 | -2 | -15 |
| 18 | 17.8 | 15 | 13.7 | 23 | 14 | 5 | -7 | -21 |
| 19 | 18.0 | 12 | 13.7 | 22 | 12 | 3 | -10 | -25 |
| 20 | 17.5 | 10 | 13.5 | 18 | 8 | -2 | -16 | -33 |
| 21 | 20.4 | 8 | 15.3 | 13 | 11 | 7 | -1 | -11 |
| 22 | 22.4 | 6 | 17.0 | 2 | 7 | 7 | 3 | -3 |
| 23 | 23.9 | 3 | 18.4 | -10 | 1 | 3 | 2 | -1 |
| 24 | 24.3 | 1 | 19.1 | -17 | -3 | 1 | 1 | -2 |

## VK STH — ASIA

| UTC | MUF | DBU | FOT | 14.2 | 18.1 | 21.2 | 24.9 | 28.5 |
|---|---|---|---|---|---|---|---|---|
| 1 | 23.2 | 2 | 18.4 | -13 | -1 | 2 | 1 | -3 |
| 2 | 23.1 | 0 | 18.6 | -17 | -3 | 0 | -1 | -4 |
| 3 | 23.4 | 0 | 19.2 | -19 | -5 | -1 | -1 | -4 |
| 4 | 23.7 | 0 | 17.9 | -20 | -5 | -1 | 0 | -3 |
| 5 | 23.9 | 1 | 19.8 | -19 | -4 | 0 | 0 | -3 |
| 6 | 23.3 | 1 | 19.2 | -16 | -3 | 0 | 0 | -3 |
| 7 | 22.9 | 2 | 18.8 | -12 | -1 | 2 | 0 | -4 |
| 8 | 22.4 | 3 | 18.3 | -6 | 3 | 4 | 1 | -4 |
| 9 | 22.0 | 7 | 17.9 | 6 | 9 | 8 | 3 | -3 |
| 10 | 21.7 | 12 | 18.1 | 19 | 17 | 13 | 6 | -2 |
| 11 | 21.3 | 14 | 17.2 | 24 | 20 | 14 | 6 | -3 |
| 12 | 21.0 | 15 | 16.9 | 25 | 20 | 14 | 6 | -4 |
| 13 | 20.9 | 15 | 16.7 | 26 | 21 | 14 | 6 | -4 |
| 14 | 21.1 | 16 | 16.8 | 27 | 22 | 15 | 7 | -3 |
| 15 | 21.0 | 16 | 16.6 | 28 | 22 | 15 | 6 | -4 |
| 16 | 20.8 | 16 | 16.9 | 28 | 21 | 15 | 6 | -4 |
| 17 | 19.8 | 16 | 15.5 | 27 | 19 | 12 | 2 | -9 |
| 18 | 18.8 | 15 | 14.6 | 25 | 17 | 9 | -2 | -15 |
| 19 | 17.8 | 15 | 13.7 | 23 | 14 | 6 | -7 | -21 |
| 20 | 17.1 | 10 | 13.2 | 19 | 7 | -4 | -20 | -39 |
| 21 | 16.1 | 10 | 12.5 | 16 | 3 | -10 | -28 | ... |
| 22 | 19.7 | 8 | 15.5 | 17 | 11 | 4 | -7 | -19 |
| 23 | 21.6 | 6 | 16.6 | 2 | 7 | 6 | 2 | -5 |
| 24 | 23.0 | 4 | 17.9 | -7 | 3 | 4 | 2 | -2 |

## VK WEST — ASIA

| UTC | MUF | DBU | FOT | 14.2 | 18.1 | 21.2 | 24.9 | 28.5 |
|---|---|---|---|---|---|---|---|---|
| 1 | 11.2 | -38 | 8.5 | -21 | -15 | -17 | -24 | -35 |
| 2 | 11.8 | -30 | 9.0 | -19 | -14 | -17 | -24 | -35 |
| 3 | 12.0 | -25 | 9.2 | -17 | -13 | -17 | -25 | -37 |
| 4 | 11.2 | -24 | 8.6 | -14 | -14 | -19 | -30 | ... |
| 5 | 10.0 | -22 | 7.8 | -12 | -16 | -25 | -40 | ... |
| 6 | 9.5 | -17 | 7.5 | -10 | -18 | -30 | ... | ... |
| 7 | 11.9 | 0 | 9.4 | -1 | -9 | -19 | -34 | ... |
| 8 | 16.6 | 10 | 13.3 | 13 | 7 | 0 | -11 | -24 |
| 9 | 20.2 | 11 | 15.4 | 15 | 13 | 10 | 4 | -4 |
| 10 | 19.8 | 4 | 15.0 | -1 | 3 | 3 | -1 | -6 |
| 11 | 20.6 | -4 | 16.4 | -21 | -8 | -4 | -4 | -7 |
| 12 | 20.0 | -12 | 15.8 | -35 | -16 | -10 | -8 | -10 |
| 13 | 19.6 | -18 | 15.8 | ... | -22 | -14 | -11 | -12 |
| 14 | 18.8 | -23 | 14.6 | ... | -25 | -17 | -13 | -13 |
| 15 | 17.9 | -28 | 13.8 | ... | -27 | -18 | -14 | -15 |
| 16 | 17.1 | -32 | 13.0 | ... | -27 | -19 | -15 | -15 |
| 17 | 17.4 | -31 | 13.1 | ... | -28 | -19 | -15 | -15 |
| 18 | 18.1 | -29 | 13.5 | ... | -29 | -19 | -15 | -15 |
| 19 | 19.7 | -24 | 15.6 | ... | -30 | -20 | -14 | -13 |
| 20 | 19.3 | -23 | 15.0 | ... | -27 | -18 | -14 | -15 |
| 21 | 15.8 | -30 | 12.2 | -40 | -22 | -16 | -15 | -18 |
| 22 | 13.5 | -37 | 10.4 | -32 | -18 | -15 | -17 | -23 |
| 23 | 11.9 | ... | 9.1 | -27 | -16 | -16 | -20 | -28 |
| 24 | 11.0 | ... | 8.4 | -23 | -16 | -17 | -23 | -32 |

## VK EAST — EUROPE L.P.

| UTC | MUF | DBU | FOT | 14.2 | 18.1 | 21.2 | 24.9 | 28.5 |
|---|---|---|---|---|---|---|---|---|
| 1 | 11.2 | -37 | 8.6 | -21 | -15 | -18 | -25 | -36 |
| 2 | 11.9 | -29 | 9.1 | -19 | -15 | -18 | -26 | -37 |
| 3 | 12.0 | -24 | 9.3 | -16 | -14 | -18 | -28 | -40 |
| 4 | 11.3 | -22 | 8.8 | -14 | -15 | -21 | -33 | ... |
| 5 | 10.0 | -21 | 7.8 | -12 | -18 | -28 | ... | ... |
| 6 | 9.4 | -16 | 7.4 | -11 | -22 | -35 | ... | ... |
| 7 | 11.3 | -4 | 9.0 | -4 | -14 | -25 | ... | ... |
| 8 | 15.3 | 6 | 12.2 | 7 | 1 | -7 | -20 | -34 |
| 9 | 19.6 | 12 | 13.7 | 18 | 14 | 9 | 1 | -8 |
| 10 | 19.1 | 10 | 13.3 | 12 | 11 | 7 | 1 | -7 |
| 11 | 18.4 | 4 | 13.0 | 1 | 4 | 2 | -4 | -11 |
| 12 | 18.1 | -5 | 12.5 | -13 | -5 | -4 | -7 | -13 |
| 13 | 17.6 | -14 | 12.4 | -27 | -13 | -10 | -10 | -14 |
| 14 | 16.9 | -23 | 11.7 | -37 | -19 | -14 | -13 | -16 |
| 15 | 16.2 | -29 | 11.3 | ... | -22 | -16 | -14 | -17 |
| 16 | 15.8 | -34 | 11.1 | ... | -24 | -17 | -15 | -17 |
| 17 | 16.0 | -34 | 11.3 | ... | -25 | -17 | -15 | -17 |
| 18 | 16.7 | -33 | 11.8 | ... | -26 | -18 | -15 | -16 |
| 19 | 18.0 | -29 | 12.4 | ... | -28 | -19 | -15 | -15 |
| 20 | 18.1 | -26 | 14.0 | ... | -26 | -18 | -15 | -16 |
| 21 | 14.9 | -34 | 11.6 | -38 | -21 | -16 | -16 | -20 |
| 22 | 12.8 | ... | 9.9 | -39 | -25 | -22 | -25 | -31 |
| 23 | 11.6 | ... | 9.0 | -36 | -25 | -24 | -29 | -39 |
| 24 | 11.0 | ... | 8.5 | -29 | -21 | -22 | -29 | -40 |

## VK STH — EUROPE L.P.

| UTC | MUF | DBU | FOT | 14.2 | 18.1 | 21.2 | 24.9 | 28.5 |
|---|---|---|---|---|---|---|---|---|
| 1 | 11.2 | ... | 8.6 | -38 | -27 | -27 | -33 | ... |
| 2 | 11.8 | ... | 9.1 | -27 | -18 | -19 | -24 | -32 |
| 3 | 11.9 | -36 | 9.2 | -24 | -18 | -19 | -25 | -35 |
| 4 | 11.2 | -36 | 8.8 | -22 | -17 | -20 | -29 | -40 |
| 5 | 9.9 | -38 | 7.8 | -19 | -19 | -24 | -36 | ... |
| 6 | 9.3 | -37 | 7.3 | -17 | -21 | -29 | ... | ... |
| 7 | 11.0 | -20 | 8.7 | -14 | -17 | -25 | -38 | ... |
| 8 | 14.6 | -7 | 11.6 | -7 | -8 | -13 | -23 | -35 |
| 9 | 20.0 | 1 | 16.0 | 1 | 2 | -1 | -7 | -14 |
| 10 | 20.1 | 5 | 16.1 | 5 | 6 | 4 | -1 | -8 |
| 11 | 18.3 | 3 | 14.1 | 3 | 3 | 0 | -6 | -15 |
| 12 | 17.4 | -3 | 13.4 | -7 | -3 | -5 | -10 | -18 |
| 13 | 18.7 | -10 | 14.9 | -22 | -10 | -8 | -9 | -14 |
| 14 | 18.1 | -19 | 14.3 | -35 | -19 | -14 | -13 | -16 |
| 15 | 17.7 | -25 | 14.3 | ... | -24 | -17 | -15 | -17 |
| 16 | 17.0 | -31 | 13.2 | ... | -26 | -19 | -16 | -18 |
| 17 | 16.3 | -35 | 12.5 | ... | -27 | -20 | -17 | -19 |
| 18 | 15.8 | -38 | 12.0 | ... | -28 | -20 | -17 | -19 |
| 19 | 16.0 | -38 | 12.1 | ... | -28 | -20 | -17 | -19 |
| 20 | 16.7 | -35 | 12.4 | ... | -29 | -21 | -18 | -19 |
| 21 | 14.4 | ... | 11.3 | ... | -30 | -24 | -23 | -27 |
| 22 | 12.4 | ... | 9.7 | ... | -38 | -34 | -36 | ... |
| 23 | 11.4 | ... | 8.9 | ... | -39 | -37 | ... | ... |
| 24 | 10.9 | ... | 8.4 | ... | -37 | -36 | ... | ... |

## VK WEST — EUROPE L.P.

| UTC | MUF | DBU | FOT | 14.2 | 18.1 | 21.2 | 24.9 | 28.5 |
|---|---|---|---|---|---|---|---|---|
| 1 | 25.1 | -7 | 18.9 | -37 | -16 | -9 | -7 | -8 |
| 2 | 22.1 | -7 | 16.7 | -28 | -12 | -8 | -8 | -11 |
| 3 | 19.4 | -7 | 14.6 | -19 | -9 | -7 | -10 | -16 |
| 4 | 17.5 | -6 | 13.1 | -11 | -6 | -8 | -14 | -23 |
| 5 | 15.9 | -3 | 11.9 | -4 | -4 | -9 | -18 | -31 |
| 6 | 14.6 | 1 | 10.9 | 1 | -4 | -12 | -25 | -40 |
| 7 | 14.1 | 7 | 10.7 | 7 | -2 | -13 | -29 | ... |
| 8 | 13.9 | 10 | 10.5 | 10 | -1 | -13 | -30 | ... |
| 9 | 13.5 | 12 | 10.2 | 10 | -3 | -16 | -34 | ... |
| 10 | 12.1 | 13 | 9.2 | 7 | -9 | -25 | ... | ... |
| 11 | 10.5 | 14 | 8.0 | 0 | -20 | -39 | ... | ... |
| 12 | 10.0 | 14 | 7.7 | -2 | -24 | ... | ... | ... |
| 13 | 13.4 | 13 | 10.0 | 11 | -2 | -16 | -35 | ... |
| 14 | 19.7 | 11 | 15.2 | 21 | 15 | 8 | -2 | -14 |
| 15 | 18.4 | 10 | 14.2 | 13 | 11 | 6 | -3 | -13 |
| 16 | 20.0 | 6 | 15.4 | 3 | 7 | 5 | 1 | -6 |
| 17 | 19.7 | -1 | 15.0 | -11 | -2 | -1 | -4 | -9 |
| 18 | 20.1 | -7 | 15.2 | -24 | -10 | -6 | -6 | -10 |
| 19 | 21.9 | -9 | 17.3 | -38 | -17 | -10 | -7 | -8 |
| 20 | 24.2 | -8 | 18.5 | ... | -22 | -13 | -8 | -7 |
| 21 | 26.0 | -7 | 20.1 | ... | -26 | -14 | -8 | -6 |
| 22 | 26.2 | -7 | 20.7 | ... | -26 | -15 | -8 | -6 |
| 23 | 26.2 | -7 | 21.0 | ... | -25 | -14 | -8 | -6 |
| 24 | 26.7 | -6 | 21.2 | ... | -21 | -12 | -7 | -6 |

## VK EAST — NTH/CENT AMERICA

| UTC | MUF | DBU | FOT | 14.2 | 18.1 | 21.2 | 24.9 | 28.5 |
|---|---|---|---|---|---|---|---|---|
| 1 | 23.9 | -7 | 17.6 | -40 | -18 | -10 | -7 | -7 |
| 2 | 23.3 | -7 | 17.6 | -30 | -13 | -8 | -7 | -9 |
| 3 | 20.9 | -6 | 15.8 | -21 | -9 | -6 | -8 | -13 |
| 4 | 19.2 | -5 | 14.4 | -13 | -5 | -5 | -10 | -17 |
| 5 | 17.7 | -2 | 13.3 | -5 | -2 | -5 | -12 | -22 |
| 6 | 16.4 | 1 | 12.3 | 1 | -1 | -6 | -16 | -29 |
| 7 | 15.7 | 5 | 11.9 | 7 | 1 | -7 | -20 | -35 |
| 8 | 15.2 | 10 | 11.4 | 12 | 2 | -8 | -23 | -40 |
| 9 | 14.4 | 11 | 10.9 | 12 | 0 | -12 | -28 | ... |
| 10 | 12.7 | 12 | 9.7 | 8 | -7 | -21 | ... | ... |
| 11 | 10.8 | 13 | 8.3 | 1 | -18 | -37 | ... | ... |
| 12 | 10.3 | 13 | 7.9 | -2 | -23 | ... | ... | ... |
| 13 | 13.9 | 13 | 10.4 | 12 | -1 | -14 | -32 | ... |
| 14 | 18.9 | 14 | 14.7 | 22 | 16 | 9 | 0 | -11 |
| 15 | 18.1 | 9 | 13.9 | 11 | 9 | 5 | -3 | -13 |
| 16 | 17.3 | 0 | 13.2 | -4 | 0 | -2 | -8 | -17 |
| 17 | 17.5 | -8 | 13.2 | -18 | -8 | -7 | -10 | -16 |
| 18 | 18.2 | -14 | 13.6 | -30 | -14 | -10 | -11 | -14 |
| 19 | 19.9 | -15 | 15.7 | ... | -20 | -13 | -10 | -12 |
| 20 | 21.8 | -14 | 16.4 | ... | -24 | -15 | -10 | -10 |
| 21 | 23.2 | -12 | 17.8 | ... | -27 | -16 | -10 | -9 |
| 22 | 23.9 | -11 | 18.6 | ... | -28 | -16 | -10 | -9 |
| 23 | 24.0 | -11 | 19.0 | ... | -27 | -16 | -10 | -8 |
| 24 | 24.3 | -8 | 19.6 | ... | -23 | -13 | -8 | -7 |

## VK STH — NTH/CENT AMERICA

| UTC | MUF | DBU | FOT | 14.2 | 18.1 | 21.2 | 24.9 | 28.5 |
|---|---|---|---|---|---|---|---|---|
| 1 | 24.6 | -8 | 19.0 | ... | -24 | -13 | -8 | -7 |
| 2 | 22.2 | -10 | 16.7 | ... | -19 | -11 | -8 | -10 |
| 3 | 19.3 | -12 | 14.5 | -32 | -15 | -10 | -10 | -13 |
| 4 | 17.3 | -13 | 13.0 | -24 | -11 | -9 | -12 | -18 |
| 5 | 15.6 | -12 | 11.7 | -17 | -9 | -10 | -15 | -23 |
| 6 | 14.3 | -10 | 10.7 | -11 | -7 | -11 | -19 | -31 |
| 7 | 13.9 | -5 | 10.5 | -5 | -5 | -11 | -22 | -36 |
| 8 | 13.8 | 1 | 10.4 | 1 | -3 | -11 | -24 | -39 |
| 9 | 13.4 | 8 | 10.1 | 7 | -2 | -12 | -27 | ... |
| 10 | 12.1 | 12 | 9.2 | 7 | -6 | -20 | -39 | ... |
| 11 | 10.5 | 13 | 8.1 | 3 | -15 | -32 | ... | ... |
| 12 | 10.1 | 15 | 7.8 | 1 | -18 | -37 | ... | ... |
| 13 | 13.5 | 16 | 10.0 | 14 | 1 | -11 | -29 | ... |
| 14 | 19.9 | 14 | 15.4 | 24 | 18 | 11 | 1 | -10 |
| 15 | 19.4 | 14 | 15.0 | 19 | 16 | 11 | 4 | -5 |
| 16 | 18.7 | 8 | 14.3 | 7 | 8 | 6 | 0 | -8 |
| 17 | 18.7 | 1 | 14.5 | -6 | 1 | 1 | -2 | -8 |
| 18 | 17.9 | -7 | 13.7 | -19 | -7 | -5 | -6 | -12 |
| 19 | 18.2 | -13 | 13.8 | -29 | -13 | -8 | -8 | -11 |
| 20 | 18.9 | -16 | 14.2 | -40 | -18 | -11 | -9 | -11 |
| 21 | 20.7 | -15 | 16.3 | ... | -24 | -14 | -9 | -9 |
| 22 | 22.6 | -13 | 17.1 | ... | -28 | -16 | -10 | -8 |
| 23 | 24.1 | -11 | 18.5 | ... | -29 | -17 | -10 | -7 |
| 24 | 24.6 | -9 | 19.3 | ... | -28 | -16 | -8 | -6 |

## VK WEST — NTH/CENT AMERICA

# HAMADS

## TRADE HAMADS

● WEATHER FAX programs for IBM XT/ATs *** RADFAX2 is a high-resolution shortwave weather fax, Morse & RTTY receiving program. Needs CGA, SSBhf radio & RADFAX decoder. Also RF2HERC, RF2EGA and RG2VGA, same as RADFAX2 but suitable for Hercules, EGA and VGA cards respectively, $35 *** SATFAX is a NOAA, Meteor and GMS weather satellite picture-receiving program. Uses EGA or VGA modes. Needs EGA or VGA colour monitor and card, + WEATHER FAX PC card, $45 *** All programs are on 5.25" or 3.5" disks (state which) + documentation, add $3 postage. ONLY from M Delahunty, 42 Villiers St, New Farm Qld 4005. Ph (07) 358 2785.

● AMIDON FERROMAGNETIC CORES: for all transmitter and receiver applications. Send DL size SASE for data/price to RJ & US Imports, Box 157, Mortdale NSW 2223 (no enquiries at office please . . . 11 Macken St, Oatley). Agencies at: Geoff Wood Electronics, Sydney. Webb Electronics, Albury. Electronic Components, ACT. Truscott's Electronics, Melbourne. S Willis, Perth. Assoc TV Service, Hobart.

## FOR SALE - NSW

● INFO TECH M300C keyboard transmitting and INFO TECH M200F code receiver converter. As brand new. Imported from USA, top level high-tech equipment. Cost $1600. What offers?Also National Panasonic communications receiver DR48 double superhet. (02) 958 5412.

● YAESU FT101E, good cond, $500. Hy-Gain 18V allband vert antenna $85. Fuzz Buster radar detector $85. Peter VK2DBI QTHR (063) 67 5095.

● TRANSFORMER 240V to 110V 2KVA $150 ono. Jack VK2VO (02)982 4290.

● KENWOOD TM2570A 2M FM 5/70W keyboard entry $550. ICOM IC701 HF Tcvr RM3 remote control digital TX audio fault service manual $450. VK2RZ (043) 62 1235.

● 30-METRE kit of traps for Mosley TH33 complete new. Purchased in error. Identical to 40-metre kit 3KW pep C Maloof VK2AMA. (02) 599 1126. Offers.

● KENWOOD TL922 HF linear, as new in original box $2100 ono. VK2DT QTHR (02) 868 1131.

● ICOM 28A/E 2M FM transceiver 25W, handbook, homebrew battery pack $480. Bob VK2YEL QTHR (02) 639 0267.

● STC Lowband 100W base and 4MTR25 mobiles $150 the lot. AR7 with all boxes $50. BC640 VHF TX $50. ASR33 Teletype $75. AWA carphones $10 each. SCR 522 $15 each. Plus heaps of miscellaneous radio and computer chassis and parts. Everything must go — moving house. Dean VK2ZID (02) 487 3052.

● IBM-XT compatible computer, suit packet etc. Dual 360K drives, 512K RAM, CGA card, mono monitor, serial and parallel port, made in USA, $395. VK2KGG QTHR (02) 958 8703.

## FOR SALE - VIC

● YAESU FL2100Z linear amp WARC bands, good cond, best offer. Seiko SC700 scanner, good cond, best offer. (051) 99 2811 or (018) 51 3108.

● KENWOOD TS820 tcvr VF0820 XVFO $700. VK3AMB Brian AH: (03) 467 5213.

● YAESU FT101E HF TRX FV101B ext VFO. Good cond. Complete with hand-mic and handbooks. New O/P tubes (6JS6s). $500 the lot. Dick VK3AEX (053) 32 1818 (BH) (053) 32 3273 (H).

● BRAND NEW boxed tubes, 4-400A $125. 4 - 400C $150. QB4-1100 $125. QB3-300 $30. 810 $15. Used 4CX350A, GC, $25. Quality Collins linear 30L-1exc unmarked cond. 4 new 811A fitted C/W manual $1500. Kenwood TS430S, absolutely as new in box, 15 hrs shack use only. Purchased for mobile but never used. All options FM, AM, CW & 1.8 KHz SSB Filters. 2 DC leads, mobile bracket workshop manual $1375. Kenwood MC60A desk mic, new in box $110. SP930 as new in box $125. VK3GY QTHR (03) 789 4363.

● YAESU FT101B just fully serviced, EC, h'book and full service manual $400. FL2100B linear, EC, full output $775. Ron VK30M QTHR (059) 44 3019.

● KENWOOD TS820S transceiver with VF0820 external VF0 and MC50 desk mic $800 ono. Yaesu mobile linear amplifier, model FL110. $200. Mike Trickett VK3ASQ QTHR (052) 78 9766 (BH), (052) 78 1986 (AH).

● ICOM IC551D 6M all mode solid state 100W, good cond, handbook, desk mic, 4EL yagi. (053) 31 7425, Charlie VK3DCS QTHR.

● LINEAR amp tubes, Eimac 3-500Z, new in sealed cartons (two) $200 ea. Rob VK3JE (060) 37 1262 or (03) 584 5737.

● TEN TEC Delta 580 HF transceiver 1.6-30MHz including the WARC bands, 100W mobile, digital readout, h'books, all solid state, $825. Set of Yaesu mobile whips, including gutter mount and 2m stub $150. Or both the above for $850. Frequency meter, AN/URM-32 125KHz - 1,000 MHz with manuals, $80. VK3UU Max (03) 798 2003 QTHR.

## FOR SALE - QLD

● ICOM IC-02AT 2M FM handheld, GC, $300. Icom IC-4E 70cm FM handheld, GC, $200. AOR AR-2002 scanner 25-550 MHz and 800-1300 MHz. GC, $750. Microwave Modules MML 432/50 50W 70cm amplifier, $250. Ampere APB-82A 80W 2m amplifier, $150. Offers considered. Ross VK4IY, QTHR (075) 65 1445.

● TS130S HF tcvr $750. Mobile mount $25. AT130 ATU $70. AT230 ATU $150. MC50 desk mike $85. Barry VK4BIK (074) 91 7317 QTHR.

● HENRY radio linear, 3-500Z, silver plated inductor, $850. Bruce VK4BV QTHR (076) 35 1457.

## FOR SALE - SA

● 2X 15EI 470MHz yagis pwr divider and harness $200 ono. Dale VK5AFO (08) 391 2300 QTHR.

## FOR SALE - TAS

● YAESU FT707 80-10m t/ceiver $650. FV707DM ditigal extn VFO $250. FC707 ATU $250. FP707 20 Amp p/supply spkr. $320. Above all mint, hardly used, boxes. VK7AN (003) 31 7914.

## FOR SALE - WA

● KENWOOD TM221A 2m transceiver complete with books, hardly used, $400. Andrew VK6WB (09) 447 1213 QTHR.

## WANTED - NSW

● INFO on Yaesu FT480R loan or copy of handbook operation and maintenance. John VK2XKX (066) 21 2933.

● CIRCUIT for Breville console radio 1934 valve model 87 serial 206. Leo VK2QB QTHR.

● MY FT200 is OK on SSB, but IC reads full-scale on CW tuning, RF loading and drive has no effect. Any clues? George VK2YT (02) 625 2602.

● ANY info on Butternut vertical or purchase of same. VK2DJM QTHR (066) 86 8742.

● MILITARY radio equipment required by experienced collector for restoration and display. Give your old gear a good home Manuals also. Ian VK2ZIO (02) 680 2112 QTHR.

● AN/PRC25 B47 C42 gear needed, headset and mic for C42 No 19 set and boxes. Call Scotty VK2KE (ex 3ZR). AH: (060) 21 8897 QTHR.

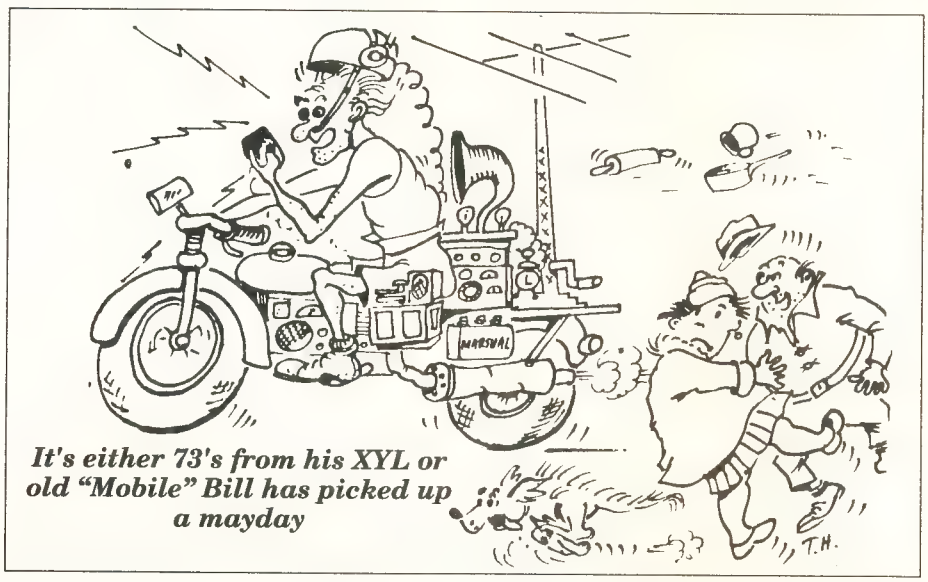
● COLLINS KWM2A prop pitch motor. Details to VK20E, PO Box 1914, Wollongong, 2500.

● YAESU FV101 ext-VFO YO10 monitor scope YC601 digital display SP101 ext speaker FTV250 2m transverter FTV650 6m transverter. Peter VK2DBI QTHR (063) 67 5095.

## WANTED - QLD

● COLLINS R390 receiver, service manual wanted. Lionel Sharp VK4NS QTHR.

● CIRCUIT diagram and control head for PYE UHF Vangard. Also Bearcat 20/20 scanner for parts. VK4WHO Pat (074) 85 1240 after 6pm




*It's either 73's from his XYL or old "Mobile" Bill has picked up a mayday*

TONY HEATON VIA VK4ADS

# MERCEDES CARS WITHSTAND 'TORTURE' TEST

A NEW 'torture' chamber where Mercedes-Benz cars and truck/trailers can be bombarded with powerful electronic and radio-wave forces is helping build in vital protection against potentially dangerous interference.

A high-powered radio transmitter and sophisticated monitors in the specially shielded chamber are used during a wide range of tests on a vehicle whilst it is running. The result is electronic units, computers and sensor systems in Mercedes vehicles which function undisturbed.

Features which undergo checks for electromagnetic compatibility (EMC) by Mercedes-Benz engineers in Germany (with the support of Siemens) include the air conditioning and sound systems. More critically, the advanced Mercedes ABS anti-locking braking and injection/ignition systems are tested for resistance to interference, from extremely high to minute levels.

Operators wear special space-like protective suits to protect them against the intense electromagnetic radiation forces in the chamber when the advanced automated measurement systems require human back-up.

To rule out disruptive interference of the electronic components on each other, ingenious shields and filters are developed through EMC research. Positive benefits include smarter engine management systems which lead to better control of exhaust emissions and more efficient fuel use.

Electronics is a rapidly growing feature of today's vehicles, with a nerve system of cables more than four kilometres long and dozens of microcomputers controlling almost everything which drives a Mercedes. **ar**

# HAMADS

Please Note: If you are advertising items For Sale and Wanted please use a separate form for each. Include all details; eg Name, Address, Telephone Number (and STD code), on both forms. Please print copy for your Hamad as clearly as possible.
*Eight lines per issue free to all WIA members, ninth line for name and address Commercial rates apply for non—members. Please enclose a mailing label from this magazine with your Hamad.
*Deceased Estates: The full Hamad will appear in AR, even if the ad is not fully radio equipment.
*Copy typed or in block letters to PO Box 300, Caulfield South, Vic 3162, by the deadline as indicated on page 1 of each issue.
*QTHR means address is correct as set out in the WIA current Call Book.
*WIA policy recommends that Hamads include the serial number of all equipment offered for sale.
*Please enclose a self addressed stamped envelope if an acknowledgement is required that the Hamad has been received.
Ordinary Hamads submitted from members who are deemed to be in general electronics retail and wholesale distributive trades should be certified as referring only to private articles not being re—sold for merchandising purposes.
Conditions for commercial advertising are as follows: $22.50 for four lines, plus $2.00 per line (or part thereof) Minimum charge — $22.50 pre—payable.

State: .....

❑ Miscellaneous
❑ For Sale
❑ Wanted

Name: .....

Call Sign: .....

Address: .....

.....

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# Solution to Morseword No 45

| | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 |
|---|---|---|---|---|---|---|---|---|---|---|
| 1 | · | · | — | · | · | — | · | · | · | · |
| 2 | · | · | — | · | — | · | · | — | · | · |
| 3 | · | — | · | — | — | — | · | — | — | — |
| 4 | — | · | · | · | · | — | — | · | · | · |
| 5 | · | · | — | · | · | — | · | · | · | · |
| 6 | · | · | — | · | · | — | · | · | · | — |
| 7 | — | · | · | — | · | — | · | — | · | — |
| 8 | · | · | · | · | · | · | — | · | — | · |
| 9 | · | · | · | · | — | · | · | · | · | · |
| 10 | — | · | · | · | · | · | · | — | · | · |

Across: 1 flee; 2 iced; 3 roam; 4 bats; 5 erase; 6 inlet; 7 nark; 8 hear; 9 sense; 10 there

Down: 1 Vera; 2 uses; 3 gates; 4 fib; 5 pier; 6 twos; 7 steel; 8 pix; 9 fire; 10 fab


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It is impossible for us to ensure the advertisements submitted for publication comply with the Trade Practices Act 1974. Therefore advertisers and advertising agents will appreciate the absolute need for themselves to ensure that, the provisions of the Act are complied with **strictly.**

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# HOW TO JOIN THE WIA

Fill out the following form and send to:

The Membership Secretary
Wireless Institute of Australia
PO Box 300
Caulfield South, Vic 3162

I wish to obtain further information about the WIA.

Mr, Mrs, Miss, Ms: .....

.....

Call Sign (if applicable): .....

Address: .....

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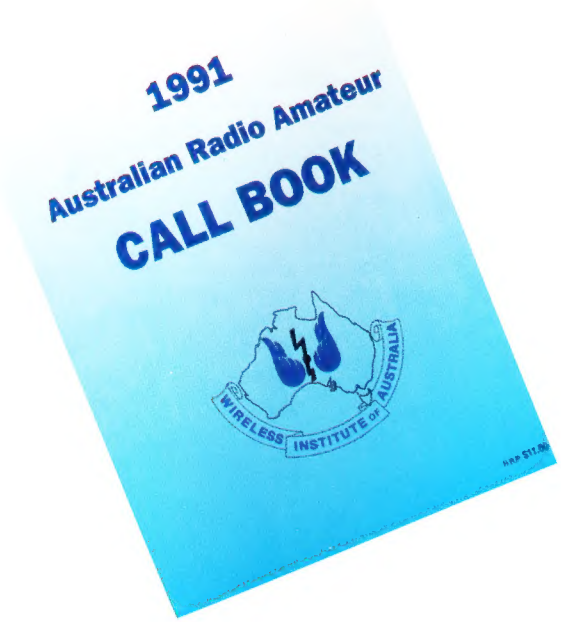
State and Postcode: .....

# WIA SLOW MORSE TRANSMISSIONS

| | |
|---|---|
| VK2BWI | Nightly at 2000 local on 3550 kHz |
| VK2RCW | Continuous on 3699 kHz and 144.950 MHz 5 wpm, 8 wpm, 12 wpm |
| VK3RCW | Continuous on 144.950 MHz 5 wpm, 10 wpm |
| VK4WIT | Monday at 0930 UTC on 3535 kHz |
| VK4WII | Tuesday at 0930 UTC on 3535 kHz |
| VK4WCH | Wednesday at 0930 UTC on 3535 kHz |
| VK5WIS | Nightly at 0900 UTC on 3542 kHz |
| VK5AWI | Nightly at 1030 UTC on 3550 kHz |
| VK6RAP | Nightly at 2000 local on 146.700 MHz |
| VK6WIA | Nightly (except Saturday) at 1200 UTC on 3.555 MHz |

# 1991 WIA AUSTRALIAN RADIO Amateur Call Book Out Now



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# The smaller we get, the better we get!

## ICOM's amazing new mini FM Handhelds

The minute you see and hold one of the Icom "S Series" mini handhelds you'll agree with our thought that "bigger is not always better and smaller is not always less".

By reducing the size of our product, maintaining high standards of quality and production and constantly improving our range, Icom's business continues to grow.
So, the smaller we get, the better we get.

IC-2SAT, IC-4SAT, IC-24AT
Overall, Icom's family of tiny miracles, the 2SAT, 4SAT and 24AT give the Handheld enthusiast ease of operation through the convenient, multi-function keyboard. Delivering a full 5W output (at 12V) they feature clear, backlit function displays, splash resistant design and durable construction for outdoor use. One of these models is bound to suit your application, camping, skiing, in the field or vehicle.
Use with built-in, rechargeable NiCd batteries (IC-2SAT, IC-4SAT only) or external power supply without having to use DC-DC converters, just the optional cigarette lighter cable or mini. power cable.

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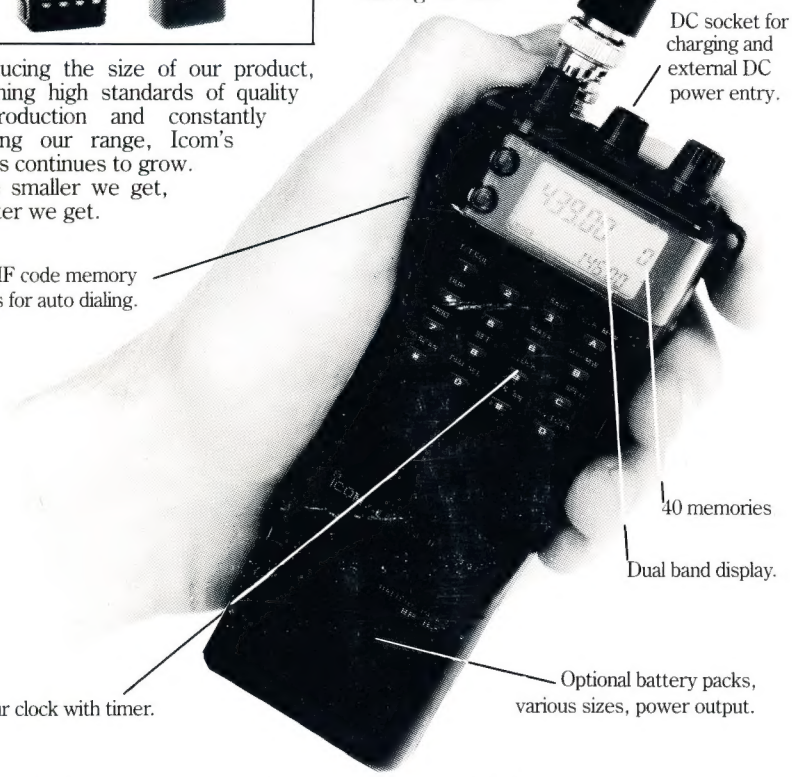
A super multi-function hand held with strong appeal for veterans, the 2SA is also the perfect way for newly licenced Amateurs to get started. This 144 MHz FM transceiver delivers 5W output (at 12V) with the optional BP-85 battery-pack, 40 memory channels, automatic power saver, LCD readout, operation from battery or external 12 volt DC supply. A PTT lockout switch is provided to prevent accidental transmissions. Amazingly its tremendous versatility and wide variety of functions are simply controlled by just six switches and three controls. An interesting and detailed colour brochure will be sent to you on request – call now for the name of your nearest stockist.

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